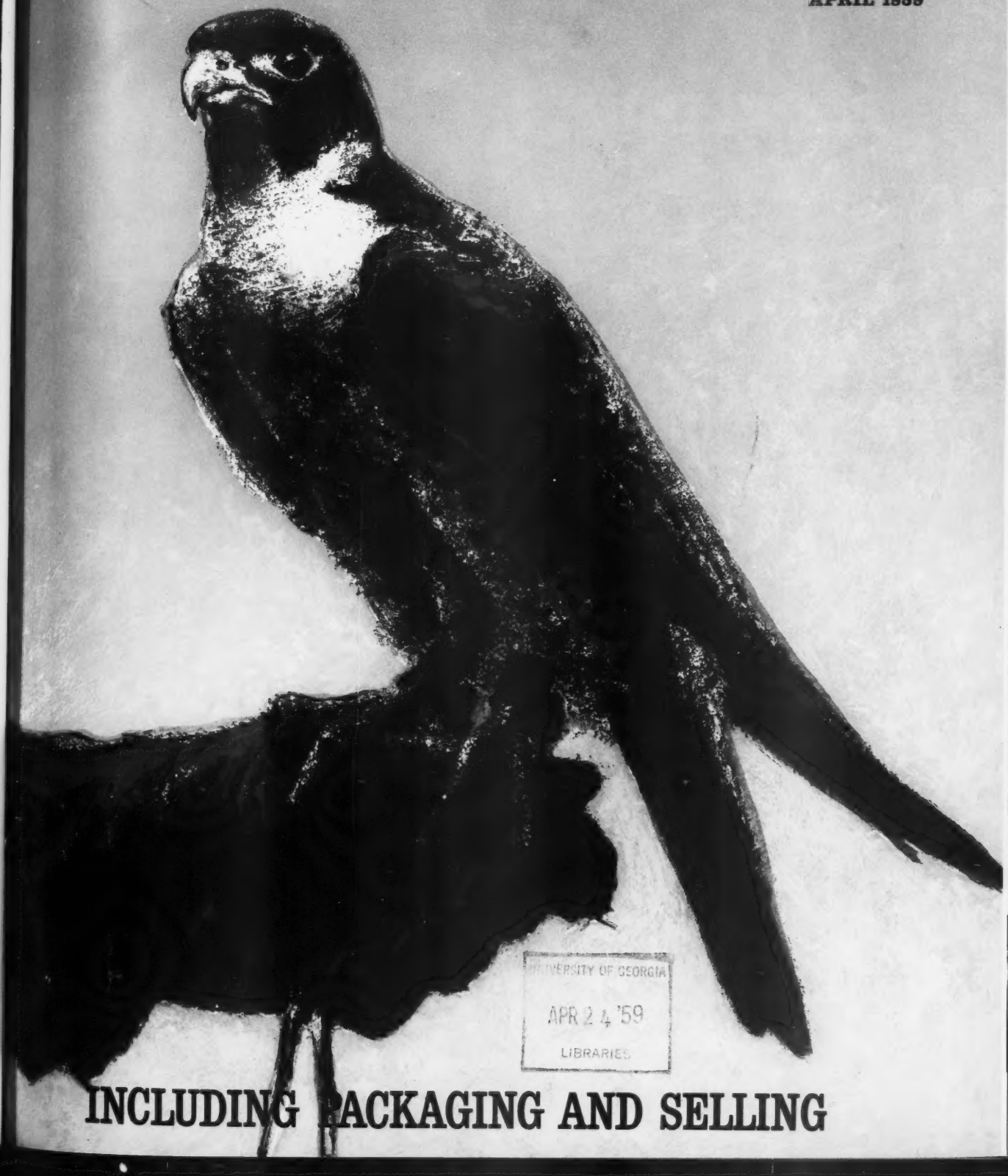
DRUG & COSMETIC INDUSTRY

APRIL 1959



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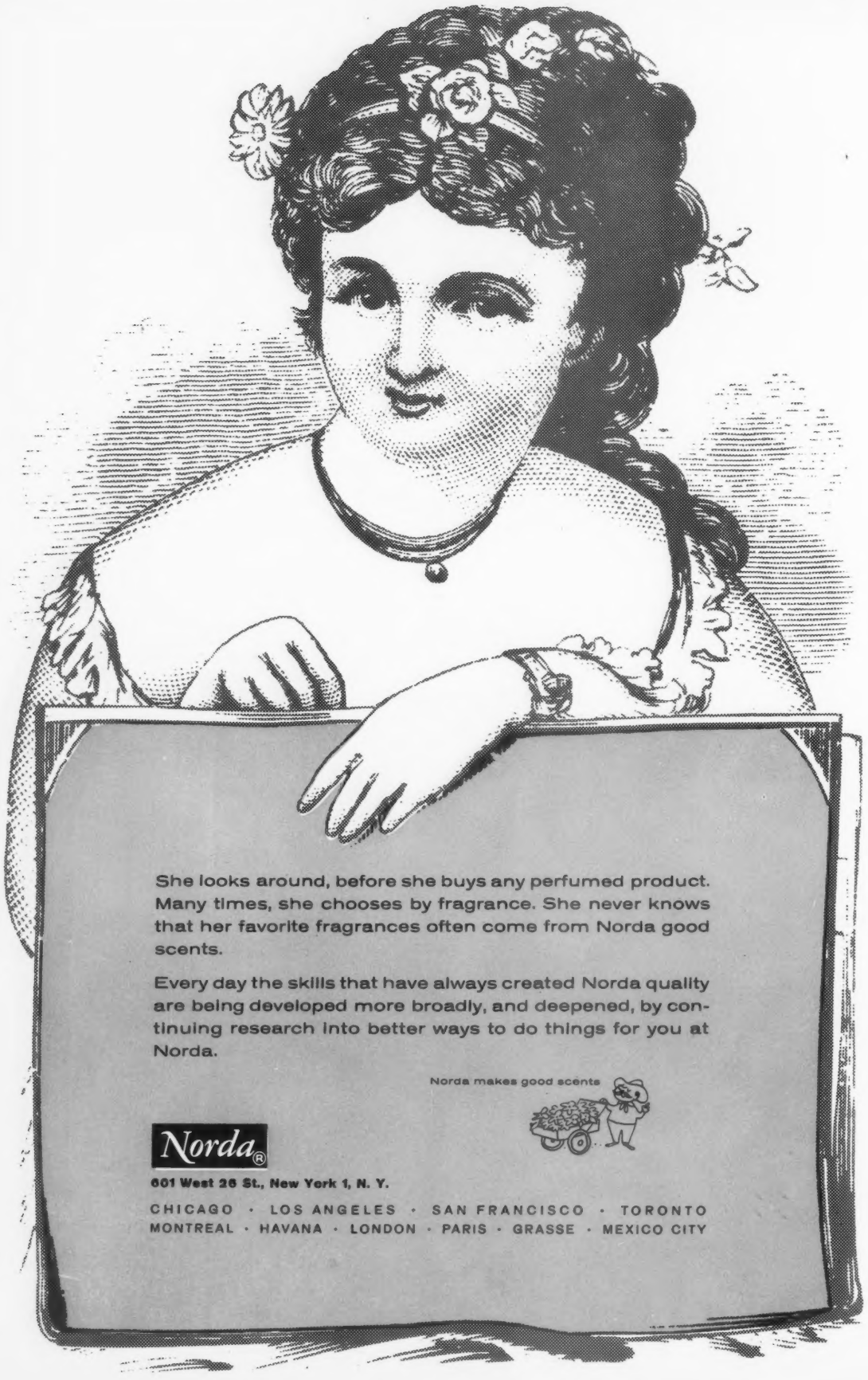

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Drug and Cosmetic Industry

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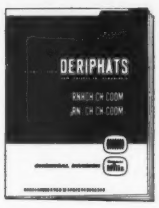
170C	$RNHCH_2CH_2COOM$	N-lauryl β-amino-propionic acid	251	viscous liquid	2500-3500 cps	0.98	50% min.	6-7	min. 80% T
160C	$RN(CH_2CH_2COOM)_2$	partial sodium salt of N-lauryl β-iminodipropionate	174	liquid	30-50 cps	1.04	30% min.	7-8	min. 80% T
154	$RN(CH_2CH_2COONa)_2$	disodium N-tallow β-iminodipropionate	232	flake	—	—	96% min.	11-13	min. 20% T
151	$RNHCH_2CH_2COONa$	sodium N-coco β-aminopropionate	276	flake	—	—	96% min.	11-13	min. 40% T

(a) M=sodium and/or hydrogen. (b) glass electrode, 1% active in water. (c) Coleman Jr. Spectrophotometer, % Transmission at 425 millimicrons.



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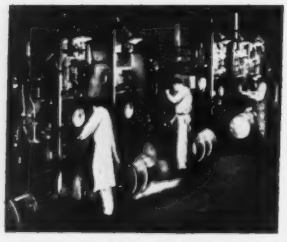
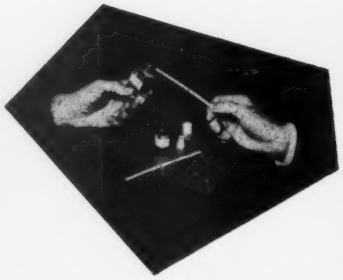
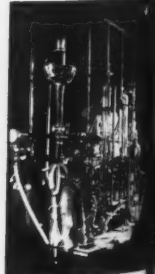


Chemical Manufacturing

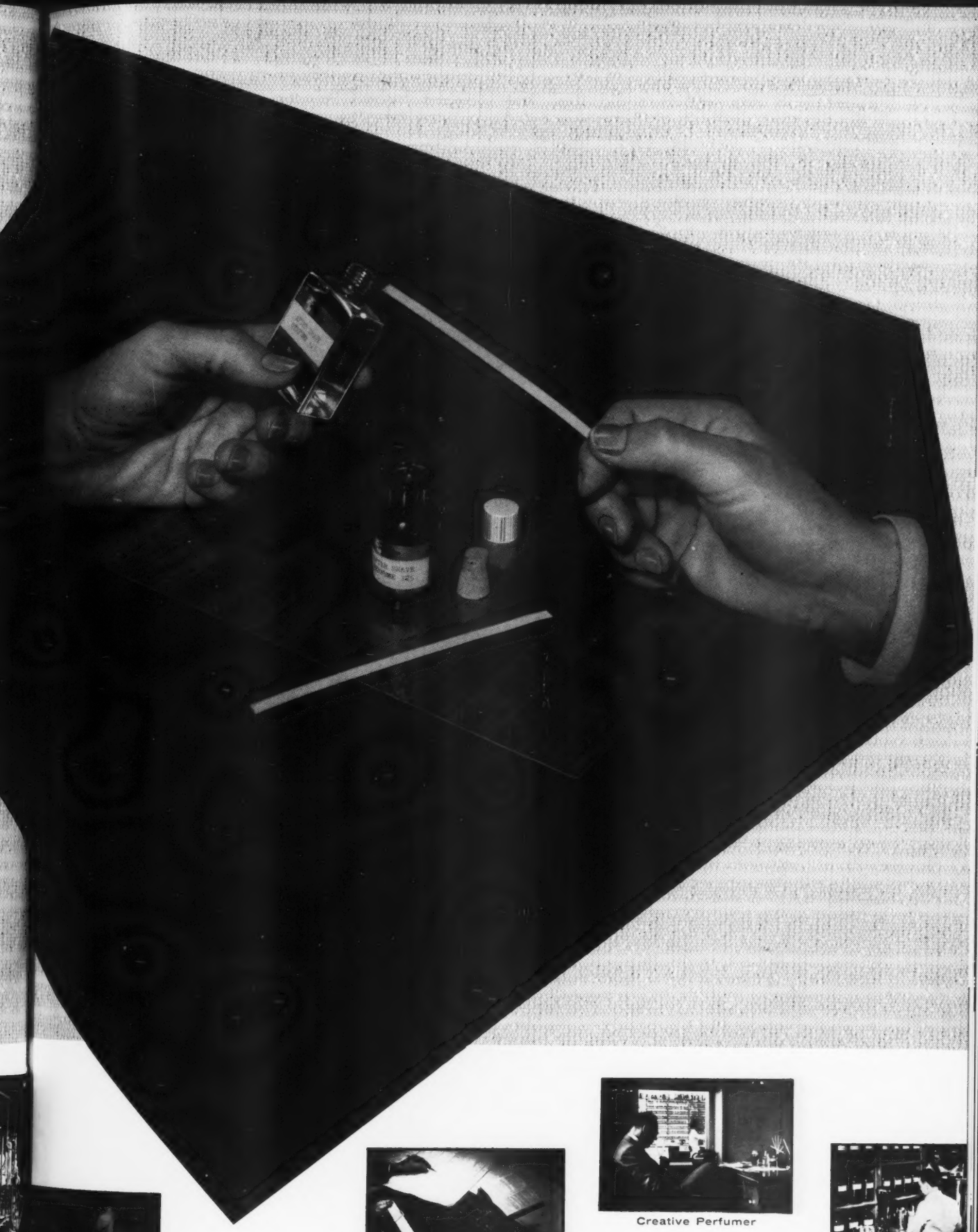
Perfume Evaluation Board



Sales



Aromatic Chemical Research



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Fatty acids are products of known composition and predictable behavior. They give maximum flexibility in the choice and ratio of fatty constituents. They have improved stability, because factors responsible for rancidity and decomposition have been removed.

Hidden Processing Costs Rule Out Fats and Oils. In the industrial soap field and in toiletries, the decision to saponify a fat or the corresponding acid may be an economic one, but many hidden costs of starting with the fat are frequently overlooked. The fatty acid yields savings in steam and labor, gives greater output per unit of equipment cost. It gives assurance of a uniformly good product, with the proper viscosity, odor and color characteristics. Greater flexibility in choosing fatty composition is possible, and products can be adapted to changing demands.

Controlled Composition Insures Product Acceptance. In many industries, fatty acids offer definite quality control advantages over fats and oils. For example, triple-pressed stearic acids like Groco 55L are produced with closely balanced physical and chemical properties which make these fatty acids invaluable in precise reactions. A case in point is esterification procedures. Such precision would be impossible with a natural fat.

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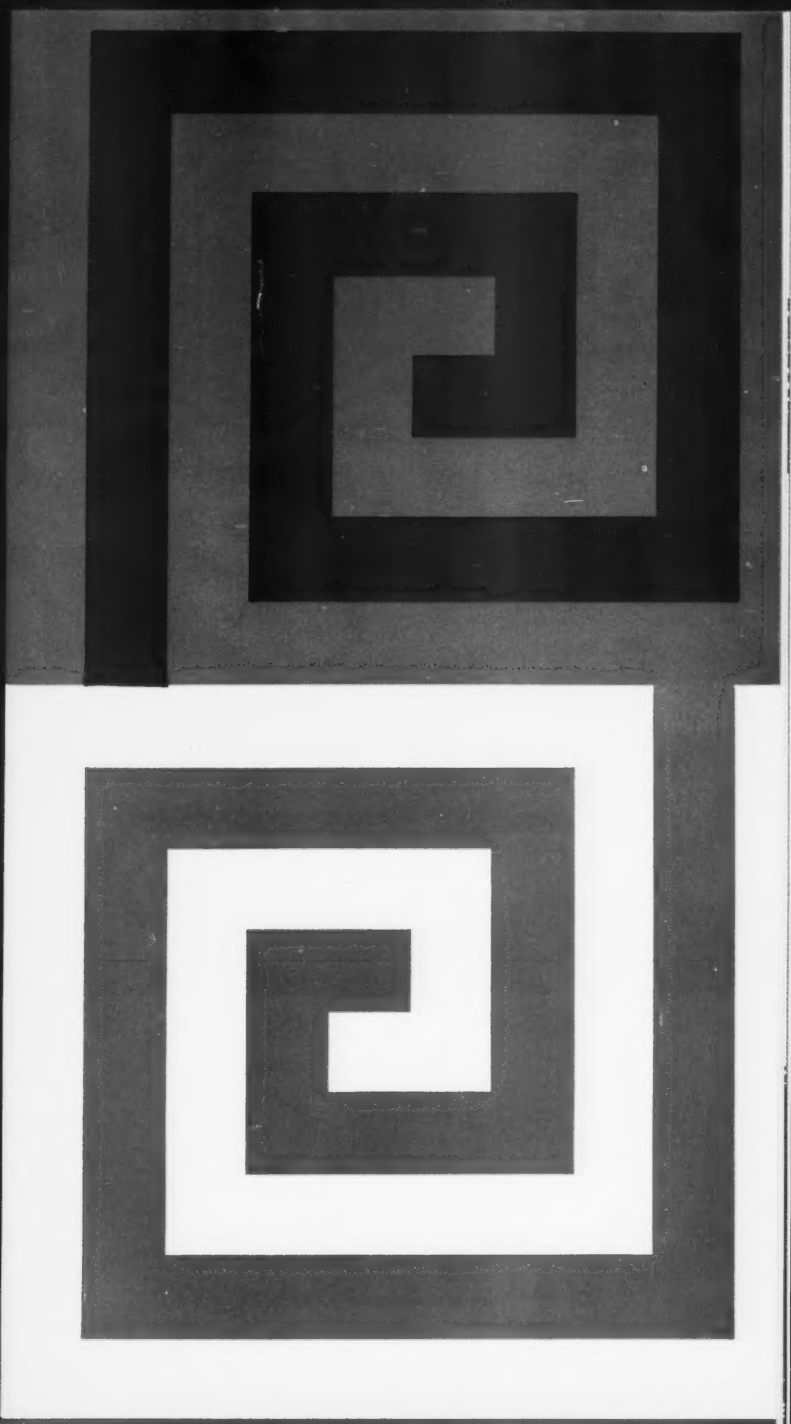

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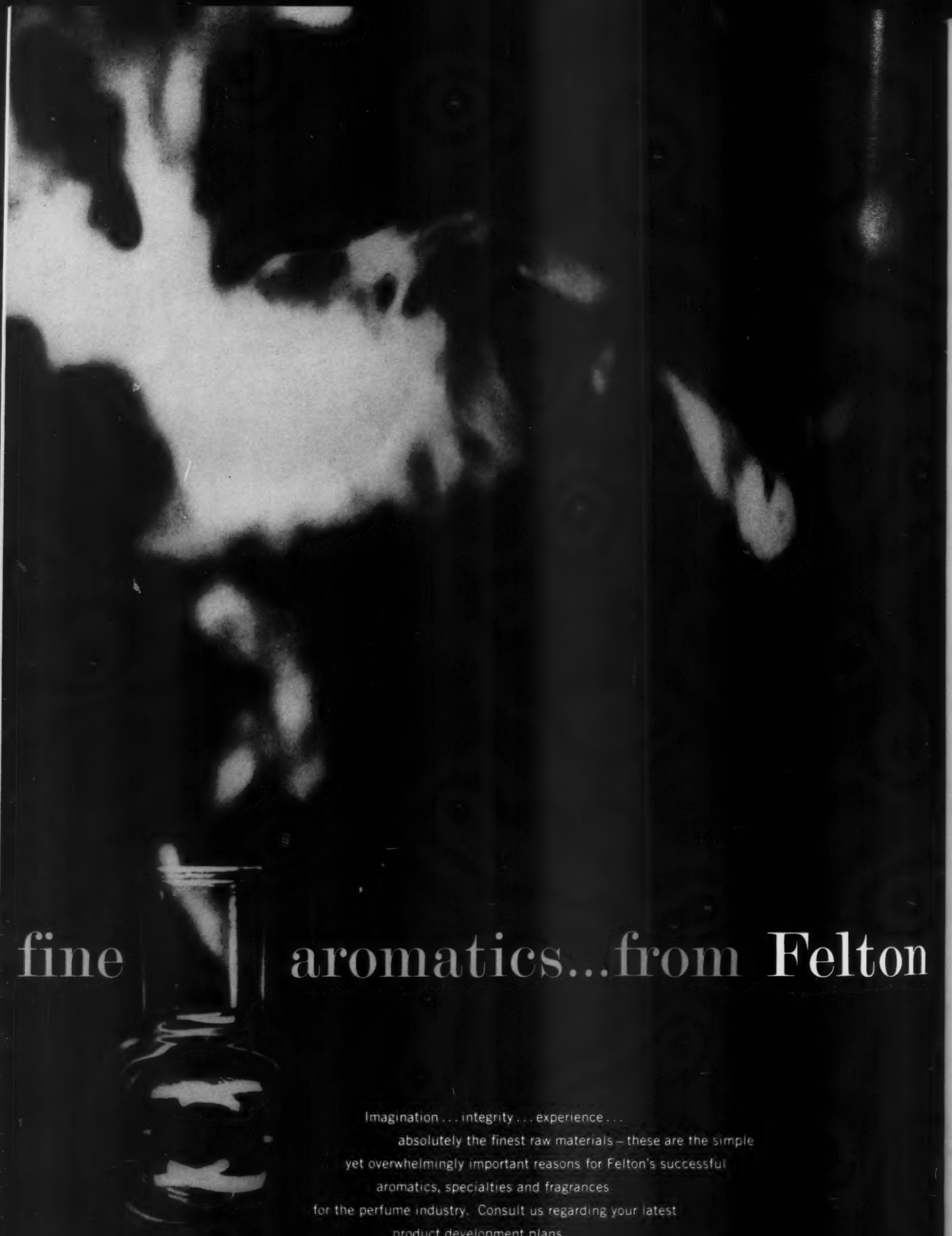

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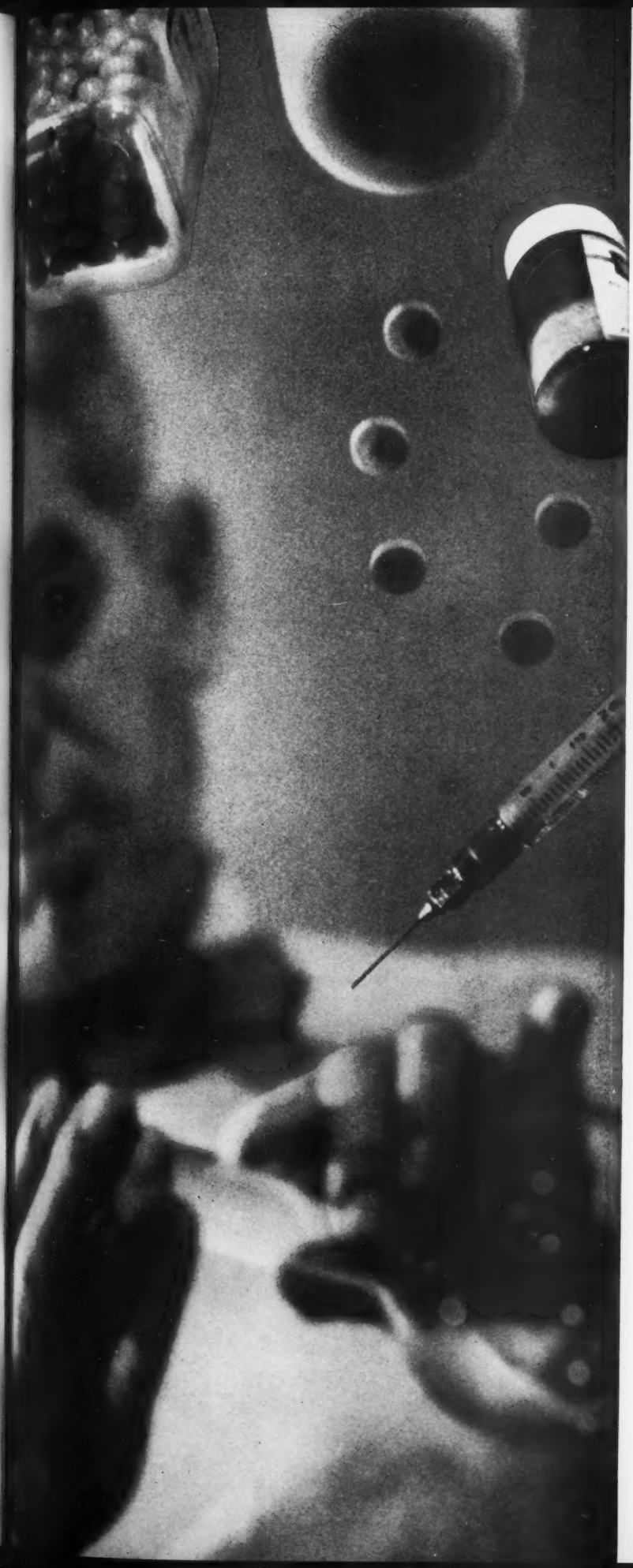

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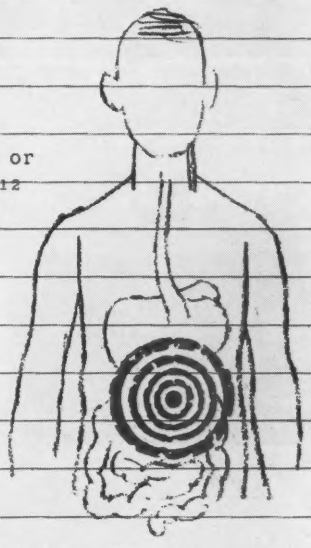

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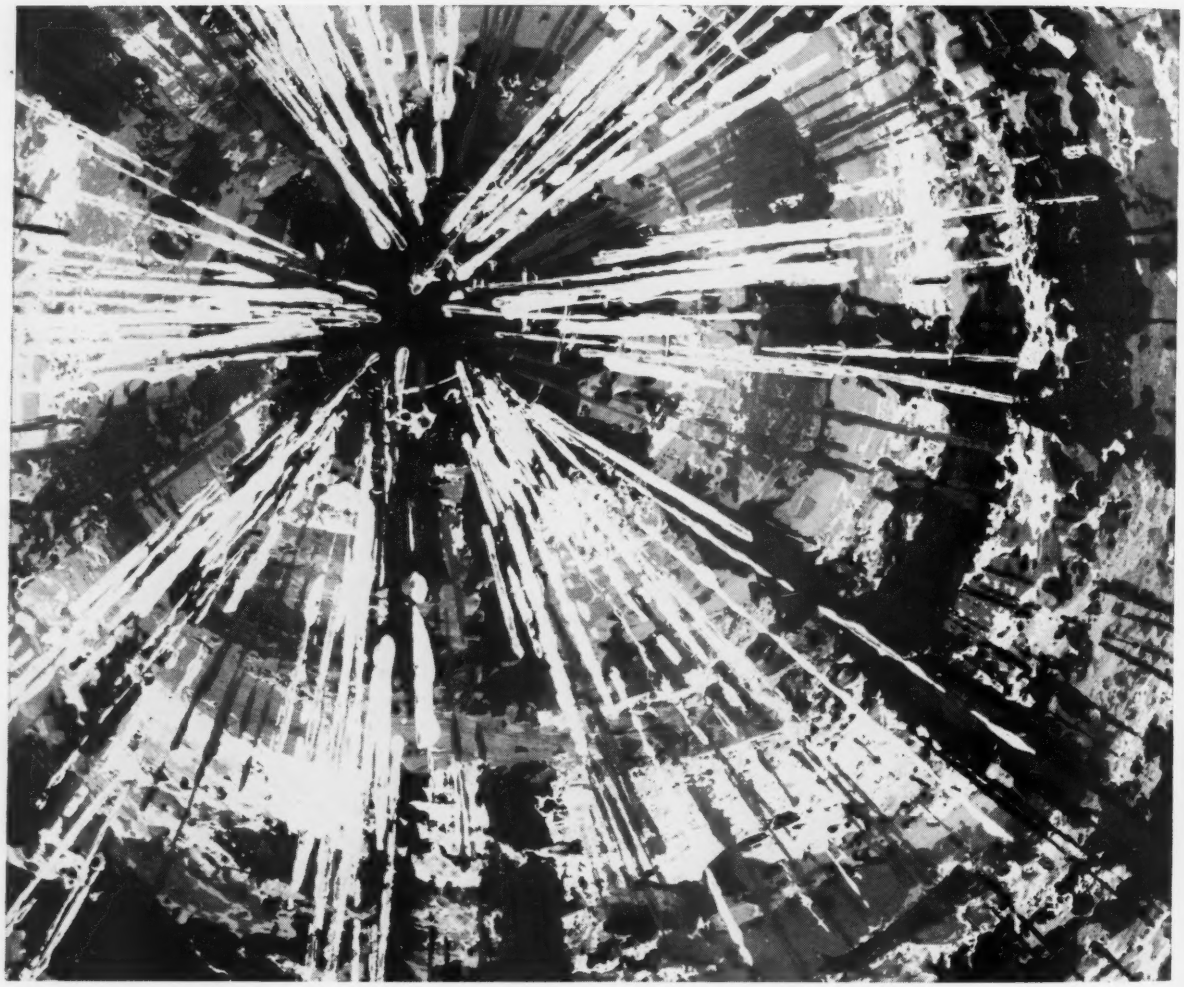

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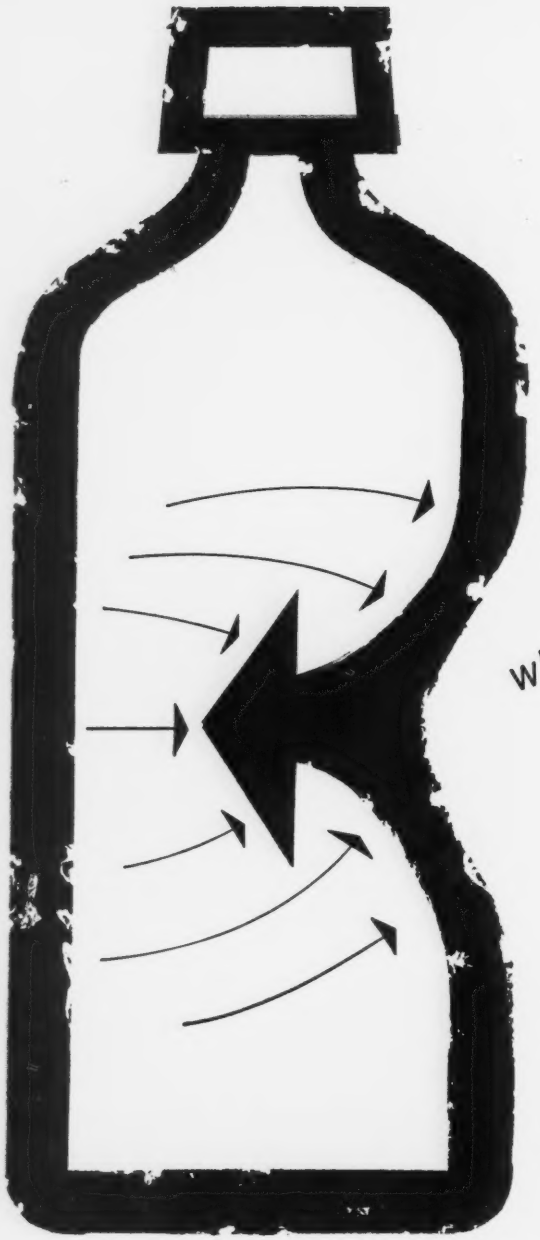

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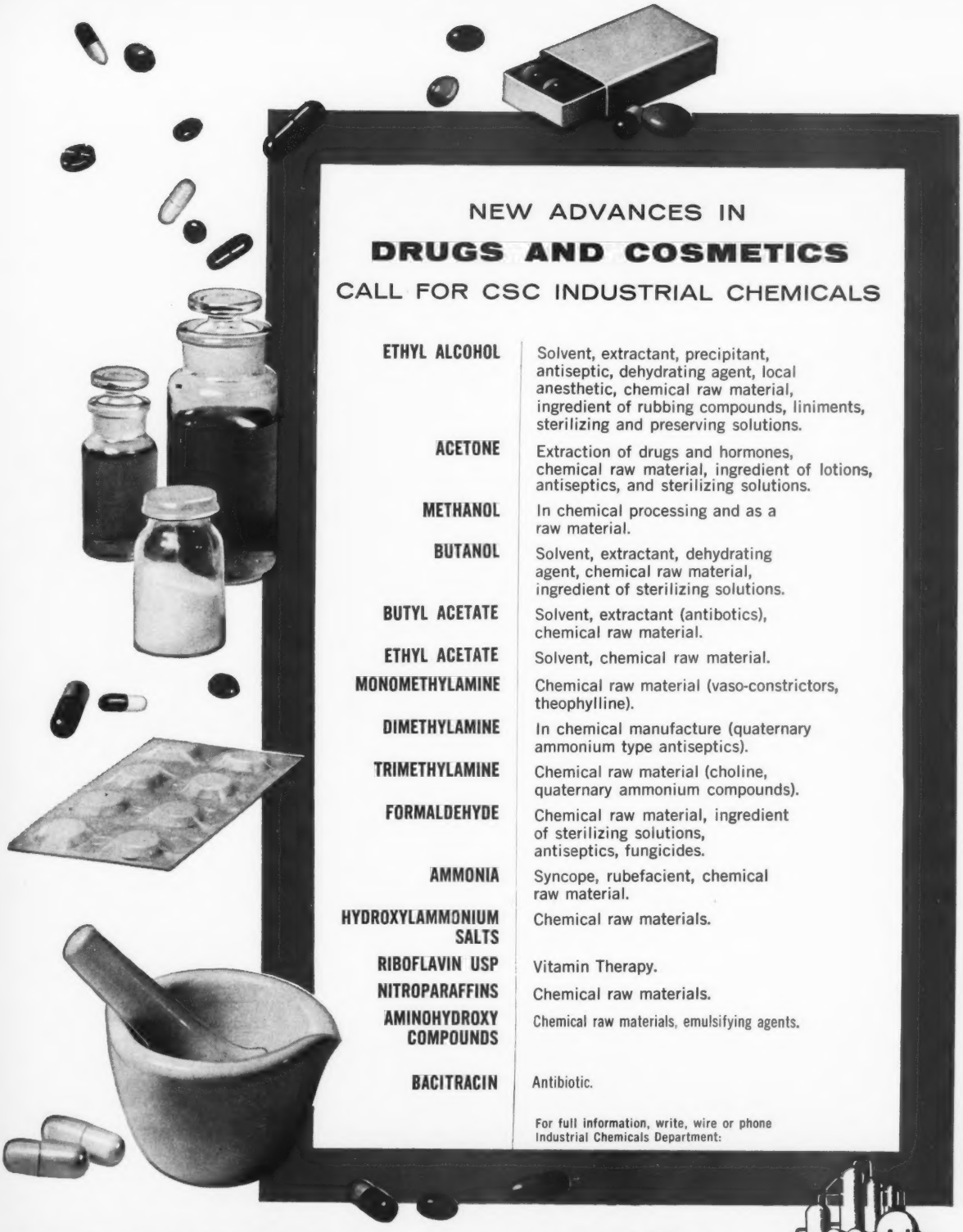

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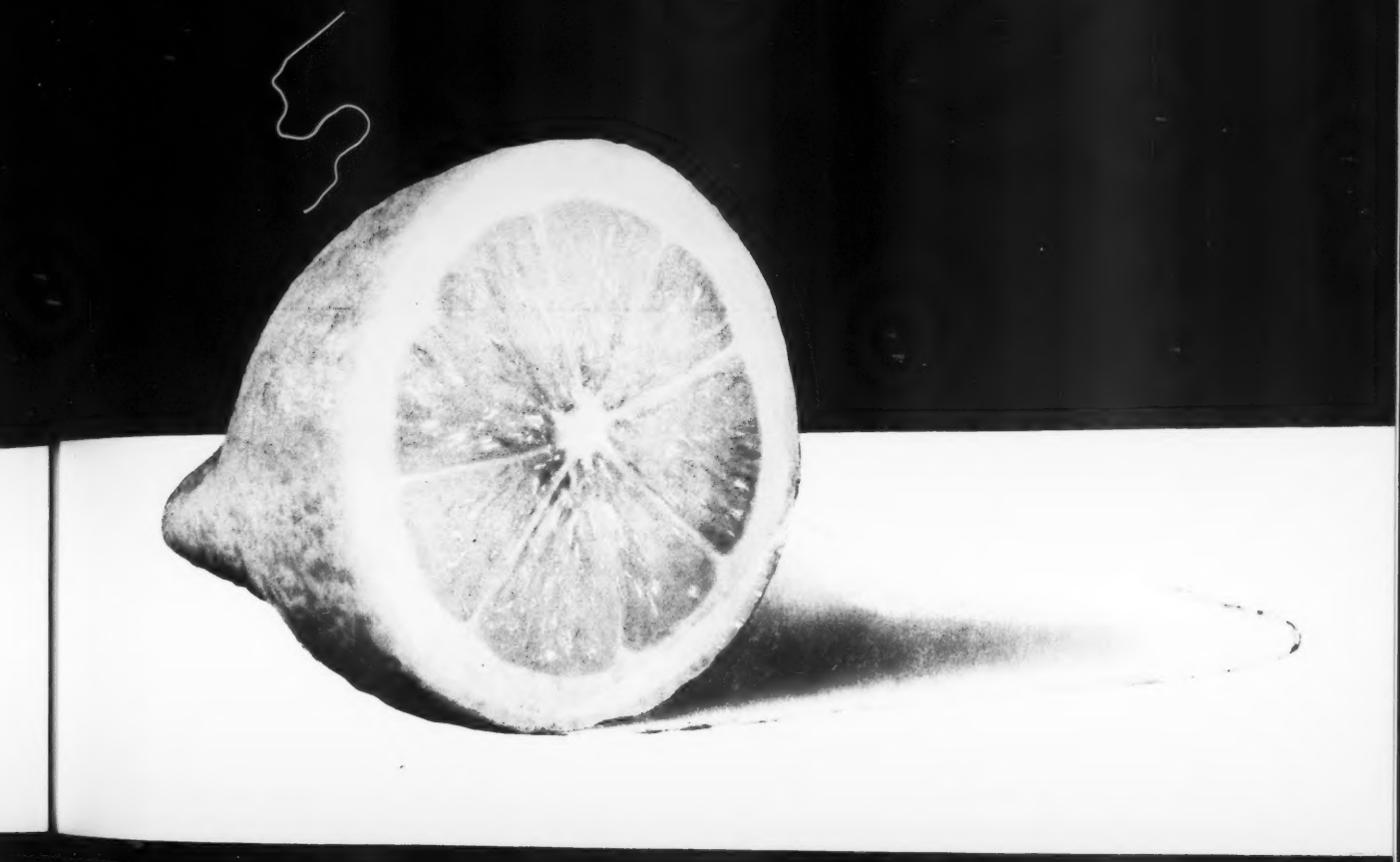

Note further details and suggestions from our data sheet.

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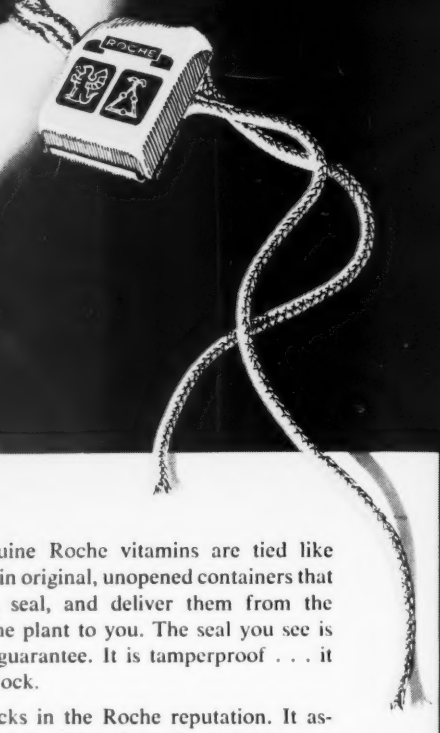

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Keeping Posted

Borden Special Products

The Special Products Division of the Borden Company is now the Borden Special Products Division of the Borden Company. This division, which has diversified and expanded for more than 20 years, includes the Pharmaceutical Division which makes and sells infant food formulas, including Bremil and Mull-Soy, and also operates Marcelle Cosmetics, Inc., a manufacturer of a full line of hyoallergenic cosmetics and dermatologicals. Other parts of the division are: Feed Supplements Department, maker of supplements for poultry and animal feed manufacturers for use in finished feeds; Soy Processing Company, which processes soy bean meal and soy bean oil for industrial and edible products; Flavor Department, which makes ice cream flavors, powders and syrups, pure and imitation vanilla, fruit drink bases, nut meats, and ice cream stabilizers and emulsifiers; Tyker Products Division, which supplies cleaners, detergents, sanitizers, and special protective coatings, mostly for industrial use; and Whitson Products Division, which makes a cheese coating base, syrups and powders, emulsifiers, whipping agents, flavors for ice cream and sherbets, carmel powder, edible milk protein, beta lactose, and other grades of milk sugar.

Soap and Detergent Value Record

Sales of soaps and detergents in 1958 reached the highest dollar volume ever recorded by the Association of American Soap and Glycerine Producers in its 23 years of sales tabulation. A large segment of the industry—67 manufacturers—reported total sales of $1,040,753,000 for 1958, up 4.3 per cent from 1957, also a record year. In terms of tonnage, 1958 production totaled 4,089,500,000 pounds, close to the 1957 level. Synthetic detergents, now constituting 72.2 per cent of total sales, amounted to 2,951,352,000 valued at $715,951,000, a 1.2 per cent increase over 1957 in tonnage, and an increase of 4.7 per cent in dollars. Liquid synthetic detergents, which have undergone dynamic sales expansion in the last few years, reached a new high of 430,744,000 pounds, up 18.5 per cent from 1957. Soap sales for 1958 totaled 1,138,148,000, down 4.3 from 1957. Dollarwise, soap sales were $324,802,000.

F.D.A. Detroit Field Office

The Food and Drug Administration is opening a new District Office in Detroit in May. This will be the first new FDA district office in 24 years. Staffed with 80 people, the office will have 37 inspectors, 22 scientists, and 59 in administrative and clerical personnel. Opening ceremonies are being held on May 14, and a banquet is being held that same evening at the Sheraton-Cadillac Hotel.

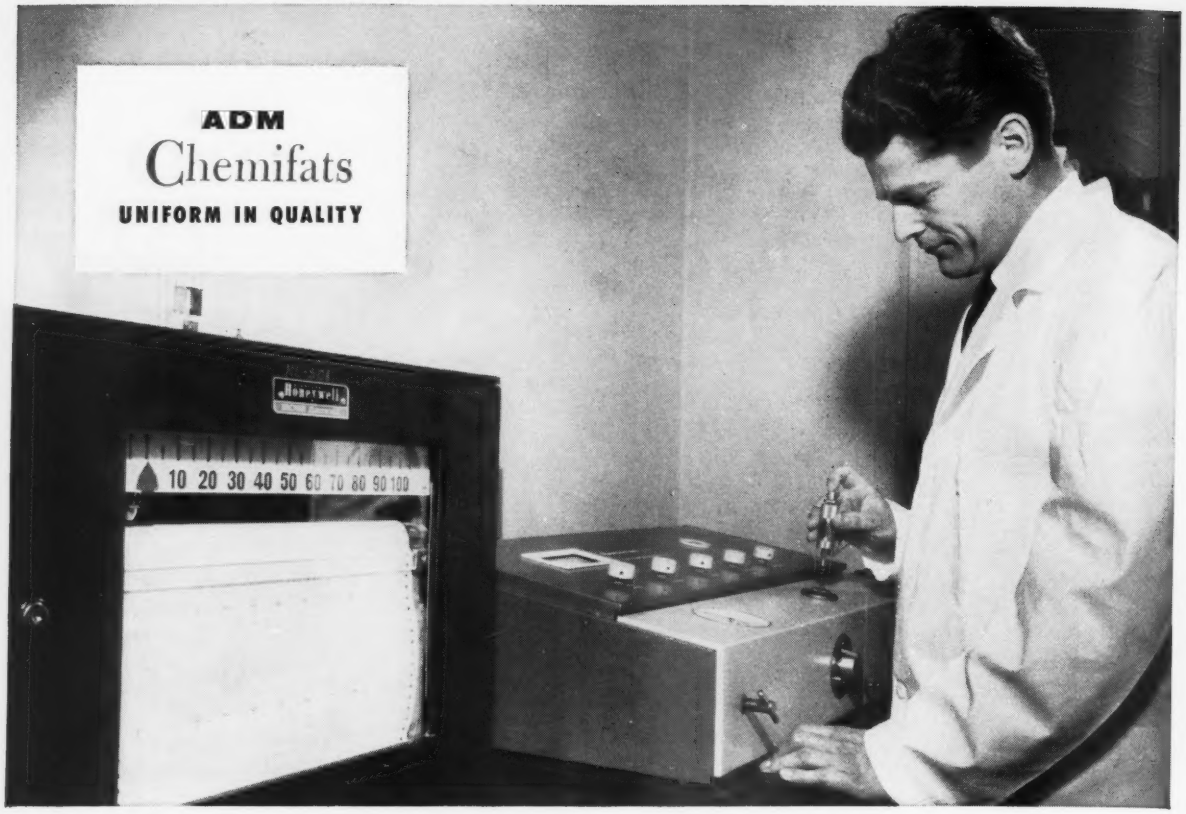
Merck Facts

Merck & Co. president John T. Connor told the New York Security Analysts: "We continue to regard ourselves primarily as a research oriented company devoted to developing products which will improve the health of man, animals, and plants. We are also concentrating on continuous improvement of our manufacturing efficiency, abroad as well as in the U. S. And we think that we have a world-wide marketing ability second to none."

Merck sales for 1958 totaled $206,636,000, an increase of $20 or about 10 per cent over 1957. Net income also advanced about 20 per cent to $27,718,000 for 1958, against $23,094,000 for 1957. Foreign sales for 1958 totaled $56 million, or 27 per cent of total sales.

Research and development expenditures totaled $17,100,000 in 1958 of which about $2,300,000 was for product and process development in the operating divisions for products already in the company's line. Money spent on products and processes before they went into production totaled $14,700,000 in 1958, against $13,100,000 in 1957.

Capital expenditures were unusually large in 1958



Gas chromatography... one more reason why you can count on ADM for Quality

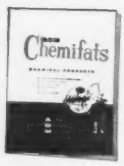
The gas chromatograph shown above is another reason why ADM can always supply fatty chemicals of uniform high quality. This remarkable instrument does an accurate analysis of a fatty acid, for example, in from a few minutes to an hour and a half. An analysis of the same accuracy by older methods would take weeks or months—if it could be done at all.

This is why ADM has equipped research and control labs alike with gas chromatographic equipment. Such advanced analytical techniques, coupled with ADM's control of raw material quality mean that ADM safeguards the quality . . . and uniformity . . . of its Chemifats throughout the manufacturing procedure.

The same aggressive, 25-year-old industrial research program that led ADM to pioneer in use of the gas chromatograph has made possible the present interesting array of aliphatic chemicals and will continue to bring you more and better products in the future.

For the soap, cosmetic and chemical specialties fields, ADM offers a complete line of cosmetic and pharmaceutical grade alcohols, hydrogenated fatty acids, vegetable acids, and hydrogenated glycerides. Careful processing and fractionation, checked by gas chromatography, mean you get what your specifications call for.

To learn more about Hydrofol Fatty Acids and other ADM Chemifats, write for our new catalog or ask to have an ADM Chemical Technical Representative call.



GET YOUR COPY of the new ADM Chemical Products catalog. This 52-page book gives specifications of the many types of aliphatic chemicals made by ADM. Write on your company letterhead today.

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when $16,700,000 was spent both at home and abroad. The foreign part of this amount was $1,700,000.

Consumer spending for medical care tripled from 1945 through 1957, rising from five to fifteen billion dollars in twelve years, said Mr. Connor. In 1945, 3.4 cents of every disposable dollar went for medical care, against 4.9 cents for 1957, an increase of 44 per cent. In 1945, $336 million was spent at the local pharmacy for prescription drugs, against $1.7 billion in 1957, or five times as much.

Three forces are working in the direction of continued expansion, according to Mr. Connor. "First, we have only begun to wage total war against disease. We have only just begun to realize that, through chemistry, biology and related sciences, we can cut mortality, lengthen life, and alleviate suffering. A score or so of important diseases have yet to be touched significantly by new drug developments.

"Second is the enormous increase in the nation's expenditures for medical research—from a mere $88 million in 1947 to a conservatively estimated $275 million this year, a rise of 550 per cent. The amounts have been rising at the rate of almost $100 million a year since 1956, so I think it is safe to predict that total national expenditures for medical research will pass the billion-dollar mark by 1965. Since research is the father of discovery, the coming decade should see an outpouring of new and effective remedies that will far surpass anything to date.

"The third force is one that is just beginning to be felt: the growing proportion of older people in our population. As a result of the lengthening of life, population experts estimate that, by 1980, there will be 24.5 million Americans over 65, a 100 per cent increase over the number in 1950. . . . We have only just begun to develop drugs that will be useful against the debilitating diseases of old age."

Figures on foreign sales are available only for seven pharmaceutical companies which have published them. These companies show an increase in foreign sales of $233.5 million in 1957, from $151.1 million in 1953, a rise in only four years of 55 per cent. By 1957, foreign business accounted for 25.7 per cent of the total business of these seven companies.

Pharmacy Education-Industry Forum

The National Pharmaceutical Council will hold a Pharmacy Education-Industry Forum at Princeton Inn, August 23 to 26. Carl K. Raiser, of Smith, Kline & French Laboratories, president of NPC, has invited the deans of all 76 of the nation'c colleges of pharmacy to nominate a faculty member for each college to attend the three-day sessions. Twenty-one NPC member companies will sponsor the Forum in cooperation with the American Association of Colleges of Pharmacy. The forum is designed to explain the philosophy and workings of the pharmaceutical industry to the educators who in turn will transmit the information to the nation's pharmacy students. "The Forum will be conducted in a tone of academic freedom similar to that enjoyed by your faculty members on their home campuses," Mr. Raiser told the deans, "There will be ample opportunity for interchange of questions and answers between educators and industry representatives."

The Forum will be conducted on a lecture-workshop basis. Four speakers will lecture during the morning sessions and be available for discussion periods with the educators in the afternoons. Prominent physicians, statesmen, educators, and pharmaceutical industry leaders will highlight the list of guest speakers. A broad orientation course surveying the pharmaceutical industry—its operations, market concepts, product planning, impact on public health—will be presented.

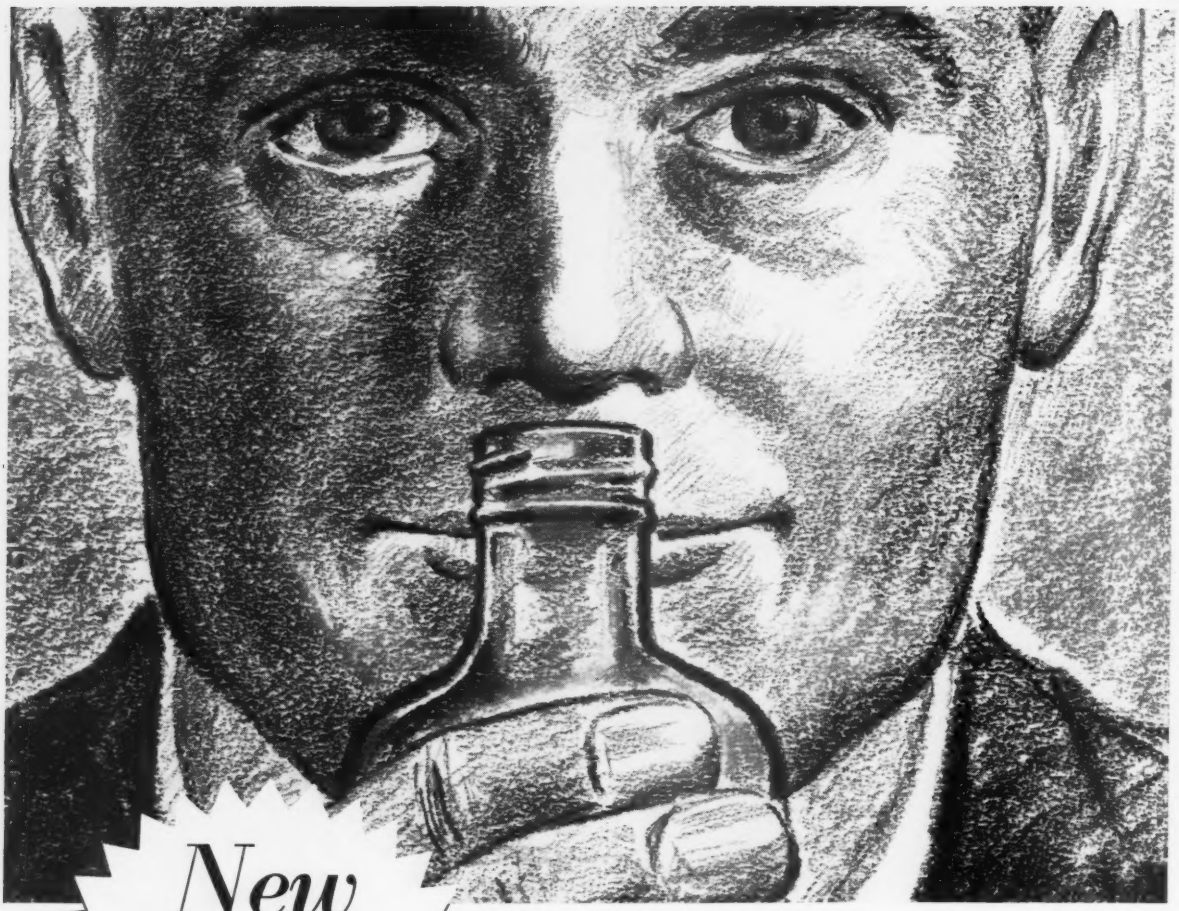
Polio Vaccines

A reduction of 15 per cent in Salk polio vaccine prices last month drew attention to the present and future of this product. This was the seventh reduction since 1956. Parke, Davis president Harry J. Loynd reported in January of this year that P.D. sold the same amount of polio vaccine in 1958 as in 1957, but prices received in 1958 were 40 per cent less than in the previous year. Loynd also said that his company's only problem with the vaccine was sufficient production facilities. Regarding the latest price cut, an Eli Lilly and Company executive said the lower prices stemmed from lower production costs, stabilization of the market situation and competition.

Lilly tells a sad story in its financial report for 1958: "The year 1958 produced a pradox as perplexing as any in the industry's experience. In spite of appeals by medical and governmental authorities, the use of poliomyelitis vaccine declined sharply. This resulted in excessive inventories in our chillrooms and outdating of vaccine. Lilly found it necessary to close down its poliomyelitis vaccine plant for over three months. Yet, in the same year, the disease paralyzed 43 per cent more Americans than in the previous twelve months.

"The irony of this event overshadowed the economic consequences, which are of interest perhaps only to the company and its shareholders. Sales of poliomyelitis vaccine dropped by $17 million, or 57 per cent, from the 1957 level, largely accounting for the ten per cent decline in our consolidated net sales." Figuring from the facts given, we find that polio vaccine sales of Lilly totaled $30 million in 1957, against only $13 million in 1958.

Merck & Co. president John T. Connor told the New York Security Analysts that although several million people are not vaccinated against polio, the market for a polio vaccine seems about filled—those who want vaccine have already taken the Salk vaccine. The future market largely will come from newborn children, he predicted. Although Merck has been concen-



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trating its efforts on improving the Salk vaccine, the company has been working with Dr. Albert B. Sabin of Cincinnati on a live vaccine, he said.

Lederle Laboratories, long a leading biological developer and producer, never entered the field of the Salk vaccine, but has long been working on the live attenuated vaccine. In this country, Lederle live vaccine has been tried on 148 families in a University of Minnesota housing project, but because highly detailed studies are continuing on the 542 subjects (285 adults, 237 children), only preliminary reports have been made. Children show a full antibody response, as expected; in adults antibody rise is less marked, maybe complicated by earlier infections.

The live vaccines are taken orally, a droplet in syrup, or in a capsule. Furthermore, it is claimed that the live vaccine taken by mouth multiplies in the digestive tract and quickly causes development of antibodies and protects the whole system, while the Salk vaccine, injected into the bloodstream, only safeguards the nervous system against paralysis.

In Russia last month, enough live polio vaccine (300 liters) for 10,000 people was being prepared by Moscow's Professor Mikhail Petrovich ChumaKov who forsaw probable immunization of Russia's 200 million people regardless of age (600 million doses, since vaccine for one strain of each of polio's three main virus types is given separately, three months apart). Czechoslavakia has used all three types, immunized 143,000.

During a polio epidemic in Singapore last August, British-trained Professor James Hale worked with Sabin's Type II vaccine. All the polio occurring was Type I. Type II vaccine is supposed to give 100 per cent protection against Type II disease, it is claimed to give 60 per cent protection against Type I as well. Type I disease began to decline sharply, and there was no Type II disease.

American live vaccine got a test on 215,000 subjects in the Belgian Congo and Ruanda. Variants developed by Lederle were used on 56,000 children under 10 in Managua, capital of Nicaragua; 90,000 children in Medellin, Colombia; 300,000 people in Uraguay. Also Argentina, Brazil, Costa Rica, and Peurto Rico have run or are planning oral vaccination campaigns.

DCAT Non-Resident Advisory Committee

An advisory committee to serve the 350 non-resident members of the Drug, Chemical and Allied Trades Section of the New York Board of Trade, has been announced by DCAT president Ralph A. Clark. Chairman is Floyd K. Thayer, of Abbott Laboratories, representing the mid-western area. Other members are Ralph L. Ericsson, of Texas Butadiene & Chemical Corporation, representing the southern states; Florin J. Hailer, delagate for the New England group; and Robert L. Ulsh, of Cutter Laboratories, representing the western states.

Lilly's "Daffy-Nitions"

Having picked a number of trademarks—and one generic name—of drug products, Eli Lilly's Physicians Bulletin recently gave what they called "Daffy-Nitions" for them. After the trademarks we give the name of the maker.

Aerolone (Lilly) all that remains of things which used to be free.
Allonal (Roche) Everything taken into consideration.
Alphalin (Lilly) Now, who'll pull him out?
Amesec (Lilly) I don't feel too good.
Aristicort (Lederle) High class motel.
Paracort (Park, Davis) Next door to that motel.
Neo-Magnacort (Pfizer) Newest and largest motel.
Beferm (U. S. Standard) Stand your ground.
Bifran (Maltbie) So long, chum.
Cafegot (Sandoz) Absent minded young steer.
Cartrax (Roerig) Tire marks in the sand.
Cerose (Wyeth) Hollywood restaurant.
Compren (Lilly) Understand?
Cyclopal (Upjohn) Bicycling companion.
Eldeo (Parke, Davis) Twelve flights down on a ship.
Flucaps (Walker) Fireplace chimney tops.
Hervatrate (Bard-Saratoga) Ivy League characteristic.
Heptuna (Roerig) Up-to-date fish.
Hyrye (Durst) Expensive beverage.
Myadec (Parke, Davis) The cards belong to me.
Navicaps (Dumas-Wilson) Sailors' headgear.
Paraflex (McNeil) Two legs.
Rutin (generic) Enthusiastic support.
Topocide (Lilly) Upper deck.
Tuinal (Lilly) And, three's a crowd.
Veratrite (Irwin, Neisler) I've heard the story before.

Drug Industry Annual NWDA Award

The Drug Industry Annual NWDA Award, represented by a statuette called Diana, has ben set by the National Wholesale Druggists Association for its associate members. Two committees of the NWDA are jointly sponsoring the contest. The Operations-Personnel Committee will conduct the section of the contest known as the "NWDA Packaging Efficiency Contest," while the Sales Management Committee's section of the contest will be known as the "NWDA Selling Sheet Contest." Each section of the contest will be judged by a committee of members from the industry, and the selling sheets and packages that have been "road tested" in the field will be judged on their relative merits. The two contests will run simultaneously from March 1 through September 15, 1959, and the winners in each category will receive their Diana statuettes at the convention at the Americana Hotel, Bal Harbour, Florida, next November.

The sales sheets must be 8½" by 11", and no

French folds, pop-ups, or other gimmick-type selling sheets will be considered. A Diana will be given for each of five categories: Pharmaceuticals, proprietaries, toiletries, sundries, and special events (Father's Day, Mother's Day, Easter, etc.)

Packages will be judged primarily on their utilitarian value—Correct marking, ease of handling, convenient size, product protection, etc. Consideration will be given to shipping container, shelf carton, and individual item package. A Diana will be given for each of the following categories: Pharmaceutical, proprietary, sundries, toiletries.

Selling sheets entered after September 15, 1959 will not be eligible for the 1959 contest, but will be automatically entered in the 1960 contest.

Operation Medipac

Operation Medipac ceremonies took place last month when the first medical shipment to the Sudan was made by Jet Transport. Originated by Hoffman Advertising, in collaboration with Dr. Peter Commanduras of MEDICO (Medical International Cooperation), and supported by the Pharmaceutical Advertising Club, Operation Medipac is sending monthly shipments of medical journals and textbooks to India, Burma, Pakistan, Indo-China, Lebanon and Jordan—with the first shipment already on its way to the Sudan. These countries can now set up libraries of current medical information. The undertaking is a move for better international public relations for the American pharmaceutical industry.

T.G.A. Scientific Program

The Toilet Goods Association Scientific Section will hold its next meeting on May 14, at the Waldorf-Astoria Hotel, New York, when the following papers will be presented: Allantoin and the Newer Aluminum Allantoinates, by S. B. Mecca, chemical director, Schuylkill Chemical Company; A Quantitative Clinical Method for Comparing Antidandruff Agents, by Herbert J. Spoor, M.D., Ph.D., Department of Medicine (Dermatology) New York Hospital and Cornell University College of Medicine; About the Mechanism of Moisture Regulation in the Horny Layers of the Skin, by O. Jacobi, Ph.D., Kolmar Research Center; Inhalation Toxicity Studies of Six Types of Aerosol Hair Sprays, by John H. Draize, Ph.D., Arthur C. Nelson, M.D., Ph.D., Sylvan H. Newburger, Ph.D., and Essie A. Kelley, B. S. Dr. Newburger is in the Division of Cosmetics, the others in the Division of Pharmacology, Bureau of Biological and Physical Sciences, Food and Drug Administration; Olfaction and Cholinesterase, by Paul G. I. Lauffer, director of research, Northam Warren Corporation; A Study of the Curling Action of Water, Hair Sprays and Waving Lotions, by E. J. Stravrakas, Fabric Research Laboratories; In Vitro and Use Tests for the Evaluation of Degerming Agents, by Harry L. Rubenkoenig and Paul A. Majors, Hill Top Research Institute, Inc.; Moisture Determination by Means of Radio Frequency Power Absorption, by Patricia Miller and John Jones, Bristol-Myers Company, and Boonton Polytechnic Company, respectively, (to be read by title and published in the proceedings).

Space Medicine

Medicine Prepares for the Space Age, is the title of a closed circuit television program broadcast into the San Francisco Civic Auditorium from the Alameda Aviation Physiology Laboratory across the bay from San Francisco. The program was presented at the 11th Annual Scientific Assembly of the American Academy of General Practice by Ciba Pharmaceuticals, Inc., in cooperation with the United States Navy.

The program featured Captain Norman Lee Barr, USN, Astronautics Division of the Bureau of Medicine and Surgery. Dr. Barr outlined many of the medical problems and peculiarities of man's coming flights into space, and demonstrated how varied types of medical data can be received by radio from any distance in space. An unusual demonstration was the instantaneous projection of the actual electrocardiogram tracings on the screen of a subject as he walked freely about the auditorium stage without direct wire connection.

Olin-Mathieson Liquidations

During 1958, Olin -Mathieson Chemical Corporation sold substantially all its holdings in the following companies: Helene Curtis Industries (to which Olin sold Lentheric), Reaction Motors, Marquardt Aircraft Co., F. H. McGraw & Co., and Hunter Engineering Co.

Also liquidated were the flashlight, electric battery, and roller skate departments of Winchester-Western Division; Powco formulated insecticides operation (taken over as John Powell & Co.); Forward House, a retail distributor of household agricultural products; and the Morgantown, West Virginia nitrogen plant.

Drug Research for 1959

Research and development expenditures for 1959 are budgeted at $190 million, compared with an estimated $170 million spent in 1958, according to a survey made by the Pharmaceutical Manufacturers Association at the suggestion of the National Institutes of Health. Figures are based on definite responses from 59 member firms of PMA representing more than 92 per cent of the total pharmaceutical business of the association membership. The total of these responses have been calculated to represent 100 per cent of the industry total for research and development as well as for support of medical education. The industry figures for support of medical education are: unrestricted grants, contributions, gifts to schools,

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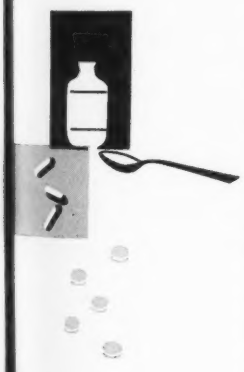

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hospitals, etc., for unspecified purposes for 1959, $5,960,000; for 1958, $5,260,000. Contributions or gifts to organizations which in turn support medical and related schools for 1959, $2,000,000; for 1958, $1,900,000. Adding these amounts to the totals for research and development, we find $197,960,000 budgeted for 1959, against $177,160,000 estimated for 1958.

In 1958, the entire PMA membership obtained or prepared 114,000 chemicals, mixtures, filtrates, etc., and tested them biologically or pharmacologically. In the clinical field, 1900 substances were tested in humans. In addition, many more materials of all kinds, including samples of plants and of soil from various parts of the world, were obtained and subjected to routine preliminary screens to determine whether or not they possessed any physiological activity.

Some experts estimate that one-half of the total research expenditures goes to support the work of organic chemists, biochemists, and other scientists in synthesizing, purifying, modifying, and preparing suitable substances for subsequent physiological tests. To obtain one drug for clinical investigation, 60 substances were prepared and biologically tested in 1958. Only 44 new chemicals were marketed by the industry in 1958, according to Paul de Haen (D.C.I., Feb. '59, 183). Of these 44 new drugs, 16 came from non-U. S. sources, and six represented minor modifications of older drugs. Therefore, expenditures for research and development in this industry resulted in 20 to 30 new drugs for 1958. Each of these drugs can be regarded as having had back of it some $6 million in total industry research and development expenditures as its share of the combined research effort. Furthermore, it must be realized that only a few of the 44 new drugs for 1958 will become outstanding commercial successes, although practically all of them represent successes in research or medical science.

The high cost of research and development is indicated by the fact that research administrators estimate that the simplest antibiotic filtrate requires from sixty to two hundred skilled man hours for preparation and testing. To synthesize and test a new chemical requires a minimum of 400 man hours. These figures apply only to substances that produce disappointing biological tests. If the drug looks promising, research time skyrockets because many more tests must be conducted.

In an effective research organization it is estimated that each scientist of Ph.D. training or its equivalent, with necessary technical help, laboratory animals, equipment, supplies, and administrative services, cost a pharmaceutical house about $40,000 a year. This figure is estimated at various levels by organizations of different size and scope, some companies estimating it at $30,000 per responsible scientist, other at $50,000.

Wider Narcotic Exemption Power Sought

The Bureau of Narcotics is seeking to amend the Harrison Narcotic Act to give the Bureau complete authority to make up a list of exempt narcotics for sale over-the-counter. Under the present law only preparations specifically mentioned—dihydrocodeine, dihydrocodeinone, noscapine, papaverine, and others —can be exempted from sales on prescription only. U. S. Narcotics Commissioner H. J. Anslinger said he would like the Bureau to have the power to exempt compounds which have little or no addiction liability. He would have the law provide for an advisory committee consisting of representatives of pharmacy, public health officials, and others concerned to assist the Bureau in making its decisions.

Towns & James v. Schering

Schering Corporation is seeking to have set aside a verdict of $49,860 in damages by a jury in favor of Towns & James, wholesale druggists of Brooklyn, N. Y. If the verdict is upheld by the U. S. District Court, the damages must be trebled to a total of $149,581. Towns & James charged that Schering had cut them off from direct purchasing because they had reduced prices below the wholesale fair trade minimums. According to the wholesale firm, the court action was brought after Schering had refused to deal with them on the grounds that Towns & James had refused to honor the fair trade contract arrangements then in force, but which were later declared illegal by the U. S. Supreme Court in the McKesson & Robbins case. Under these cases, it was stated, wholesalers were required to sell Schering goods to retailers at higher prices than those at which Schering was selling its direct accounts. Schering cut off Towns & James in April, 1955.

Following the McKesson decision in July, 1956, the wholesaler contended that Schering sent out a notice that it was abandoning its wholesale fair trade contracts, but would not deal with Towns & James. This continued refusal, the wholesaler charged, was either illegal boycott or represented an attempt at continued price maintenance. The judge charged the jury that could find for Towns & James on either of these points, but they did not have to specify which of these charges led to the verdict. So a Schering spokesman says that they do not know which one of the charges led to the verdict, or if both had.

Schering contended that the refusal to sell was only taken to protect the manufacturer's direct sales system and had nothing to do with wholesale fair trade contracts. Testimony by Schering was to the effect that Towns & James price cuts brought the wholesaler's prices to exactly the same prices at which Schering was selling its direct accounts, thereby "endangering" its entire direct sales system.

Towns & James declared that, since the fair trade contract system had been declared illegal, it had a right to cut prices.

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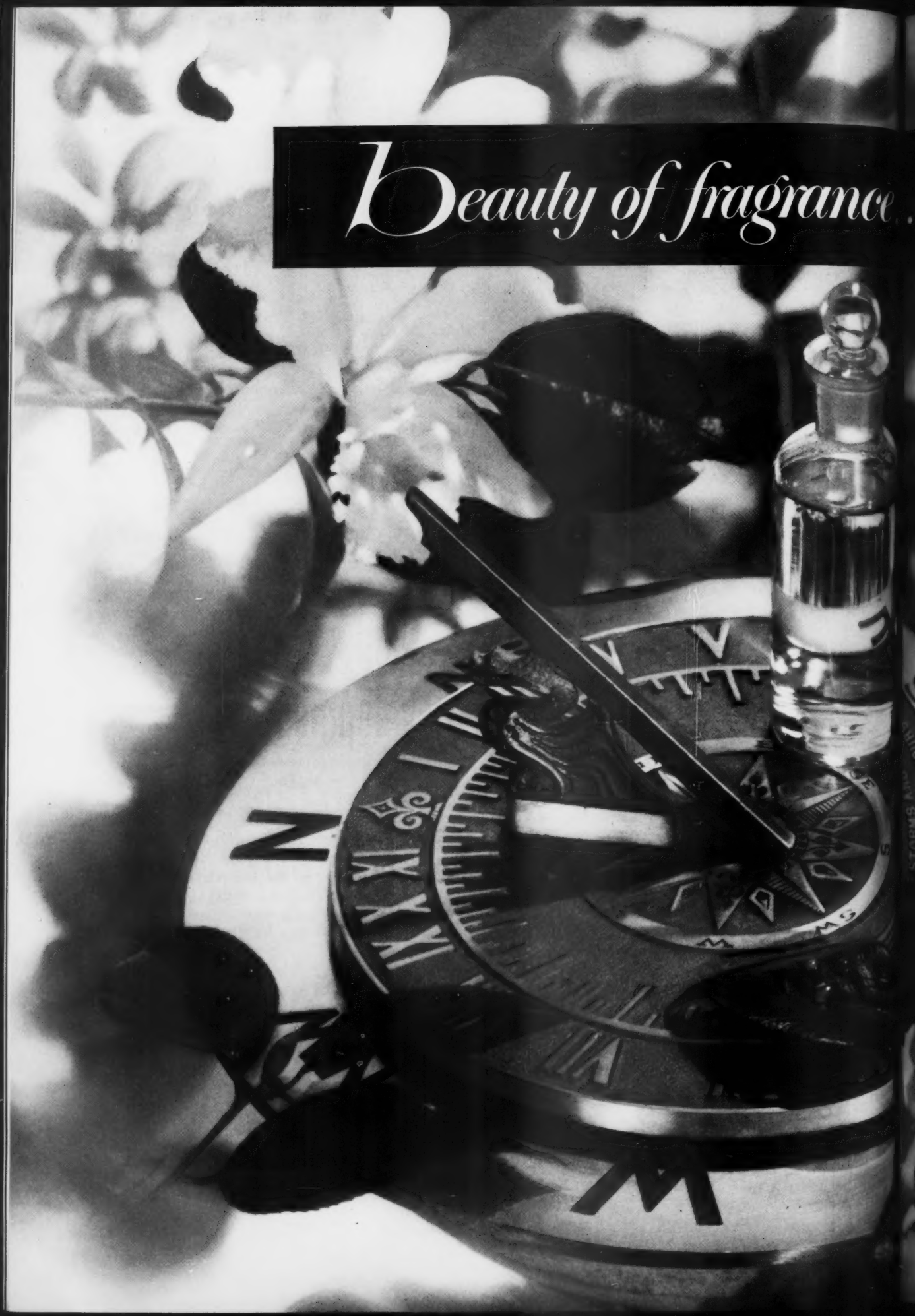
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Essential Oils
IN THE BELGIAN CONGO*

BY ERNEST GUENTHER, PH.D. FRITZSCHE BROTHERS, INC.

As the result of a recent trip to the essential oil-producing areas of Africa, Dr. Guenther has written an up-to-the-minute report on conditions as he found them. This part of his report covers the oils of the Belgian Congo. Others to follow will cover Kenya Colony, Zanzibar and Pemba, Madagascar and Comoro Islands, Reunion Island, Southern Rhodesia and Southern Africa.

Charging the plant material into the stills at a lemongrass distillery.

Harvesting lemongrass plants in the Belgian Congo.

Oil of Lemongrass

The most important producer of this oil is located about 200 miles southeast of Stanleyville, near Obokote (Kivu). Since 1946, he has cleared about 1,500 acres of jungle land, and planted 425 acres with coffee and 825 acres with lemongrass. His remaining 250 acres serve for rotation purposes. The enterprise, owned and operated by a Belgian family, has no white employees. This family built the distillery —it houses three stills, each holding about 2,600 pounds of lemongrass—as well as the living quarters, practically with their own hands, a real pioneering job.

The yield of lemongrass oil per acre and year on a prime planting averages 70 pounds; on older fields it is only half of this amount. Up to 1957, yearly production of oil amounted to almost 70,000 pounds, with a substantial increase planned for the future, if prices of the oil should be encouraging. It is interesting to note that the producer has been able to induce natives in the neighboring villages to grow lemongrass on their small holdings. The grass from these patch plantings is processed in the central distillery. In fact, about one-third of the total output of lemongrass oil in Obokote now originates from grass grown by natives. The oil is of good quality, with a high citral content, which warrants a premium price. Most of the oil goes to Switzerland.

The producers claim that under existing conditions in the Congo, and with the present low prices for lemongrass oil, a planter could not economically produce lemongrass oil without other crops, particularly coffee. Moreover, it has become unprofitable to plant lemongrass on less than 600 acres, as a smaller acreage would not carry fixed expenses and amortize the cost of the distillery.

Oils of Eucalyptus

Total production of "medicinal" eucalyptus oils in the Belgian Congo now amounts to approximately 60,000 pounds; about half of this quantity is produced by two distilleries in southern Kivu Province, the other half by one distiller in Kitwayovu, near Lake Kivu.

Leaf material for distillation originates from cultivated groves; the wild growth is not used. Cutting takes place once a year during the dry season—June to July. The crude oils obtained in the primitive field stills are rectified to meet the specifications of the United States and British Pharmacopoeias, particularly in regard to cineole content.

Oil of Eucalyptus smithii. The species planted near Lake Kivu is chiefly *Eucalyptus smithii;* the yield of oil averages 1 per cent. At prices more attractive than those now prevailing, production of the oil in this area could be increased by about 30,000 pounds. Under prevailing conditions, growers of *E. smithii*

*The writer is much obliged to his friend Mr. Etienne Legast, Goma (Kivu), for all the courtesy extended during his visit to the Congo and adjoining regions.

utilize the wood as fuel on their tea plantations; in other words, it is cheaper to burn the timber as fuel than to attempt to distill the oil.

Oil of Eucalyptus citriodora. After a modest start some ten years ago, the Congo now produces a little more than 20,000 pounds of *E. citriodora*, with a very substantial increase expected in the future. Most of the oil is exported to Europe (France, Belgium, and Holland). Producing regions are located in the northern part of Ituri District—near Djugu and Nioka—at an altitude of 5,000 to 6,000 feet. Production is entirely in the hands of some ten white settlers, each of whom operates a small distillery of local construction. Distillation material originates from plantations covering altogether 900 to 1,000 acres. However, most of these plantings are still too young to be exploited. The tops and terminal branches of the trees are cut when the trunks have reached a height of about seven feet. Harvest takes places once a year, from April to July. Whenever prices of oil are unprofitable, the trees are left to grow higher so that they can be cut for lumber.

A Eucalyptus harvester on a eucalyptus plantation in the Belgian Congo.

Extracting the vetiver root from the ground, prior to distillation.

The yield of oil from the leaf material varies between 1.5 and 2 per cent; it depends upon the weather—dry weather increases the yield. One acre produces from 110 to 140 pounds of oil. The oil contains from 70 to 75 per cent of citronellal.

Oil of Eucalyptus dives, type. The yearly output of this oil in the Congo amounts to only about 1,000 pounds. The oil is produced exclusively by one planter, located in Kitwayovu; he has about six acres under cultivation. The yield of oil from the terminal branches is high—about 3 per cent. Distillation of one batch requires 12 to 14 hours, an unusually long time. The oil contains 45 to 52 per cent of piperitone. Most of the oil goes to France.

Oil of Eucalyptus macarthuri. There are two growers near Lake Kivu who could supply several tons of this interesting "perfumery" eucalyptus oil from existing plantations. However, due to poor yield of oil (only about 0.15 per cent) and low prices, the oil is not at present produced on a commercial scale. The Congo oil contains from 50 to 60 per cent of geranyl acetate and 10 to 12 per cent of eudesmol.

Oil of Leptospermum citratum

Another interesting, although little-known, oil is that of *Leptospermum citratum*. It contains about 50 per cent of citral, 35 per cent of citronellal, some terpene and sesquiterpene alcohols and esters and a little eugenol. The odor is delightfully fresh, clean and pleasant. Perfumers in Grasse recently have shown some interest in this oil because it appears to be more stable in soaps than oils of *Eucalyptus citriodora* and lemongrass, which contain citronellal and citral, respectively, as main constituents.

A eucalyptus distillery in the Belgian Congo.

There is one grower of *L. citratum* in Kitwayovu, producing now about 1,700 pounds of this oil. By 1961 he expects to have more than 120 acres under

Etienne Legast in a vetiver distillery—oil separation, in the Congo.

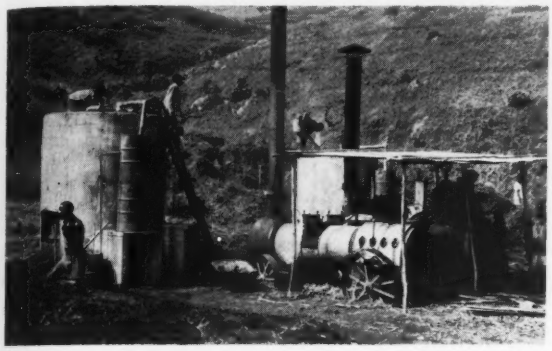
L. citratum, yielding roughly 11,000 pounds of oil. The yield of oil averages 1 per cent. Distillation of the terminal branches requires 12 to 14 hours to obtain a normal yield.

It should perhaps be mentioned that the soil near Lake Kivu on which most plantations of *Leptospermum citratum*, *Eucalyptus citriodora*, and other eucalyptus species are located has a *p*H of 7.1, which makes it unsuitable for coffee, tea, and pyrethrum.

Oil of Vetiver

Production of vetiver oil in the Congo at the present time amounts to only about 2,000 pounds per year. However, with higher prices the output could be increased substantially. There are five to six growers located in Kivu and in nearby Ruanda, the most important one being located near Beni in the former province. The dried root material supplied by these growers is trucked to Goma and processed in a small modern distillery.

The plantings near Beni are situated at 2,700 to



Distillation of geranium plants in a concrete still in Ruanda Urundi.

3,000 feet altitude. Rainfall averages 50 inches per year. The soil consists of decomposed granite, light and sandy. One acre produces about 4,000 pounds of dried roots per year, which on distillation yield 88 pounds of oil, provided the field is properly fertilized. The plants are grown for one year and then cut. After one harvest of vetiver the crop should be rotated with maize, which is plowed under to enrich the soil.

Prior to distillation, vetiver root must be comminuted, that is, reduced to short lengths in a mechanical chopper. Distillation itself requires 24 to 28 hours. One problem the producer of vetiver oil encounters in distillation is the formation of a milky emulsion; to prevent this the distillate must be kept running at 140° to 150° F., at which temperatures the oil separates on top of the distillation water. Distillation completed, the contents in the oil separators —of which there should be at least three—are kept standing overnight. As the temperature falls to normal during the night, any oil that has not yet been separated will sink to the bottom of the separators and can easily be drawn off.

If properly distilled, 100 pounds of dried vetiver root yield from 2.5 to 2.85 per cent of oil.

The most costly item in the price calculation of vetiver oil is field labor; this amounts to about 500 man-days per acre per year. In the Congo a field laborer works from early morning to noon only, earning about 50c (U.S.) per day. If the operation could be mechanized, cost would be reduced substantially, and production of vetiver oil would become a remunerative business.

Harvesting on a geranium plantation in Ruanda Urundi.

Oil of Geranium

The plants grown today in the Congo for the distillation of geranium oil were originally introduced from Reunion Island, but there appears to be some doubt as to whether they were the variety yielding the best type of oil. The quality of the Congo oil differs somewhat from that of the Reunion product; it seems possible that, in addition to other factors, the plants have undergone certain changes since their introduction into the Congo which affected the essential oil.

The geranium oil industry of the Congo began during World War II when the oil from Reunion had become very scarce and high-priced. Production of the Congo oil soon reached as much as 20,000 pounds per year, much of which was exported to the United States. Unfortunately, many lots proved to be of substandard quality, the result perhaps of a lack of know-how on the part of producers in the Congo. When prices declined to more normal levels after the war, producers either abandoned their plantations or badly neglected them. As a result, yields of oil dropped and the ventures became unprofitable. Today there are only five or six geranium planters left, producing altogether about 5,000 pounds of oil per year. Total acreage under geranium covers roughly 1,200 acres—much of it neglected and weedy, part of it under rotation. Most plantations producing the so-called Congo geranium oil are now located in Ruanda, a Belgian mandate adjoining the Congo. White settlers are not permitted to own land here; hence they have to rent land on long-range leases. Principal producing regions are Ndorwa and

(*Continued on page 515*)

PVP
HAIR SPRAY PATENT

BY JOSEPH KALISH, PH.D.

U. S. Patent 2,871,161 was issued to Maurice L. Spiegel on January 27, 1959, and assigned to La-Maur, Inc., of Minneapolis, Minn., manufacturer of beauty shop supplies; its title is "Sprayable Water-Free Alcoholic Polyvinylpyrrolidone Hair Preparation." Preliminary moves have been made by the inventor; apparently, only tentative responses have been made by industry; and perhaps the future is fraught with fireworks.

Since hair sprays totaled 94,432,000 units in 1957, up 18.6 per cent from 79,641,000 in the preceding year, and since a large proportion of these sprays are based on PVP and its derivatives, the stakes are large for all concerned.

The dictionary defines a patent as "a writing securing to an inventor, for a term of years, the exclusive right to make, use, and vend his invention." In the United States, the life of a patent is 17 years from the date of issue and the initiative is at the discretion of the patent holder. He may decide to reserve all rights to the use of the invention for himself or an exclusive licensee, or he may issue royalty-paying licenses to a few, or to many others.

If the decision in this case were for the exclusive position, the result would almost certainly be widespread litigation against infringers and expensive suits testing the validity of the patent, as well as intensified searching for other materials to by-pass the patent claims.

With general licensing, however, the problem would become solely one of economics: can the burden of royalty payment be borne, or would it be cheaper in the long run to undertake expensive litigation in an attempt to invalidate the patent? It seems that the inventor has sent out a letter pointing out that the patent has been issued and suggesting the possibility of discussions leading to royalty payment under nonexclusive licenses. Industry rumor hints at royalty payments per unit, but no present agreement; one-half cent is said to be the asking figure, down from a much higher figure, but one-quarter cent being bid. Since negotiations are still very much in progress, those involved will not talk freely.

Recent patent litigation in the cosmetic and pharmaceutical industry has proved to be long-drawn-out and very costly. Only the final decision of the courts can say whether the patent is valid or invalid; a royalty rate considered excessive encourages litigation instead of licensing.

What is the status of the patent itself? An abstract of the specifications and the claims are given below, but only a skilled patent lawyer can guess at, and only the courts can determine their validity. Since the patent was filed on July 31, 1952, and has survived at least one interference action, it cannot be readily dismissed. The breadth of coverage of the claims may also come up for adjudication, especially in deciding whether the legal meaning of polyvinylpyrrolidone covers the use of polyvinylpyrrolidone copolymers.

Abstracts of the specifications are as follows:

"In the course of experimentation with a view of finding a hair styling preparation which lacked either the sticky characteristics of the natural gums, or the cracking and breaking characteristics of shellac, I discovered that the compound known as polyvinylpyrrolidone would furnish a beautiful luster to the hair, and also the desired styling qualities without the detrimental characteristics found in the prior art substances. . . .

"For purposes of application to the hair to produce a high luster, quick drying film, the polymerized N-vinyl pyrrolidone may be combined in an alcoholic solution with a propellant of the class known as Freon, so as to be applied as a spray.

"An object of the invention is to provide a hair setting composition embodying a polymerization product of N-vinyl pyrrolidone that may be easily and quickly applied to the hair by combining said material in a solution with mutually compatible substances that will permit application to the hair by spraying.

(Continued on page 515)

A DERMATOLOGIST'S VIEW OF PRODUCT LIABILITY*

BY FREDERICK REISS, M.D.
ASSOCIATE CLINICAL PROFESSOR OF DERMATOLOGY, NEW YORK UNIVERSITY POST-GRADUATE MEDICAL SCHOOL

Let me begin by relating a case involving a Parisian judge and an American woman who sued a Parisian plastic surgeon for malpractice. She had asked for the removal of facial wrinkles and eye pouches and for a bosom with youthful lines. The wrinkles and pouches were gone, but the attempted youthful bosom was a miserable failure. The judge, after due deliberation, asked the woman her age. When she admitted that she was over 70, he observed, "C'est la vie," and dismissed the case.

Apropos of this judgment is the famous French dermatologist J. Darier's remark, "Allergy is a manifestation of life," and, since a large number of law suits involve allergic manifestations, I wish to dwell on this topic for a few moments.

Certain individuals are far more responsible for an allergic reaction than is the causative agent. Who is responsible for the hives that may follow the eating of a bowl of fresh strawberries? Is it the grocer who sold the strawberries? The farmer who grew them? If the lobster eaten at a good restaurant causes a reaction, does the fault lie with the restaurant, the lobster fisherman or even with the U. S. Government from whose waters the lobsters were taken?

It is my view that if responsibility is to be placed, then the greatest fault is that of the parents whose chromosome pattern caused the predisposition of an individual's allergy traits. The fault cannot lie with the manufacturer or distributor. Moreover, since the dermatitis following an allergic response is usually self-limiting—naturally when the use of such a cosmetic is eliminated—claims for injury are, it seems to me, not in proportion to the proper responsibility of the manufacturer.

To determine the incidence of cosmetic dermatitis, its severity and causes, I recently sent a questionnaire to 2,969 dermatologists and allergists covering their experience with cold permanent wave lotion, lipsticks, hair dyes and nail lacquers. The 956 signed replies included the information asked, but many dermatologists volunteered additional valuable data. Nail lacquer was responsible for 36.5 per cent of the allergic reactions, infrequently applied permanent wave lotion accounted for 25.2 per cent of the reactions, more likely to be due to primary irritation than allergic response, lipsticks were held responsible in only 14.6 per cent of cases and hair dyes in 23.8 per cent. Although hair dyes are often accused, it may be that the general use of patch tests before application has reduced the incidence of direct sensitization.

In the additional volunteered information, many dermatologists commented on the frequency of allergic reactions due to deodorants and detergents. Some even considered these to be more disturbing than the four main groups. A few allergies caused by hair lacquers were reported.

A second questionnaire was sent to hematologists to uncover any possible relationship between cosmetics and serious blood disorders. These were indicated in 11 cases, but proof that cosmetics were responsible was not established.

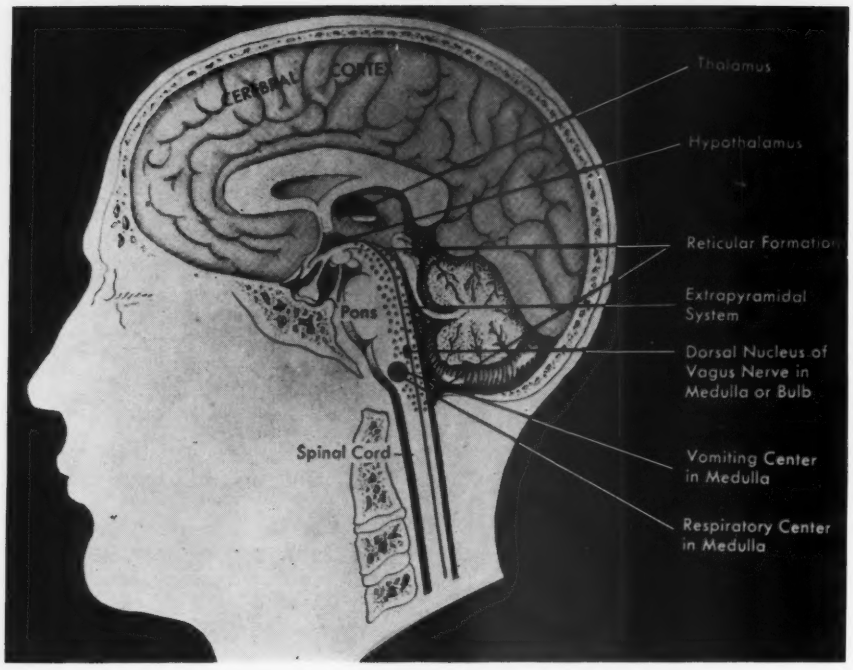
As an example of the pitfalls that may be encountered here, let me describe a recent case. A hematologist asserted that a patient had died of aplastic anemia caused by the use of a hair dye. My investigation showed that the patient had never used a hair dye; that she peddled black shoe laces dyed with an azo dye, which is structurally entirely different from the oxidation hair dyes; that although in fact she did have aplastic anemia, this was not established as the cause of death.

Allergic reactions to cosmetics have been greatly reduced by the intelligent use of patch testing; the major problem, however, is enormously complicated by the existence of cross-sensitization.

Direct sensitization by hair dye components, paraphenylene or paratoluylene diamine and other amines, is relatively rare and when encountered must be checked against possible cross-sensitization. Previously demonstrated allergic sensitivity to procaine and the sulfa drugs may result in a reaction when oxidation hair dyes are later used. Para-aminobenzoic acid, used as a sun screen, may also provoke reaction in a person sensitive to the hair dye. Where does the responsibility lie in these cases—with the secondarily used hair dye or the primary sensitizing aromatic amine? Photosensitization is a further phenomenon

(*Continued on page 540*)

*Transcript of an address before the Society of Medical Jurisprudence, The New York Academy of Medicine Building, New York City, February 1959.



MILLIONS FOR TRANQUILLITY

BY CHARLES J. KERN
WYETH LABORATORIES

It is estimated that over the past year United States drugstores and hospitals purchased more than one billion, seven hundred million dollars worth of ethical pharmaceuticals, biologicals, and nutritionals. This figure does not necessarily correspond to the sales volume of pharmaceutical concerns at the manufacturers' level, since drugstores purchase a sizeable quantity of drugs through the wholesaler, to which is added a markup to cover the expense of wholesale operation.

The tranquilizer market in 1958 amounted to 130 million dollars. In 1953 there was no tranquilizer market. This revolutionary change, which has made the words "tranquilizer" and "ataraxic" household terms in America, represents a real advance in medical science and is not merely here to stay. It is capable of far greater development as information on the physiology and chemistry of the brain permits the development of even more efficient compounds that may help to empty our mental hospitals and permit the adequate treatment of nervous and neuromuscular diseases which have so far remained almost hopeless problems to the physician.

The tranquilizer market in 1958 was surpassed in size only by the antibiotic market, which amounted to over 300 million dollars, and by vitamins, of which 184 million dollars worth were sold in 1958. Tranquilizers approximately equalled the record of cardiovascular drugs. In comparison, sales of sedatives and hypnotics amounted to only 34 million dollars in 1958, while anti-convulsants totalled six million.

A further analysis of the tranquilizer market by type shows more than 80 per cent of total sales represented by meprobamate and the phenothiazines. In terms of compounds, nine different phenothiazines share a market of 58 million dollars. Meprobamate, a distinct and different chemical entity, is represented by two products totalling 50 million dollars while the "all other" category has eleven entries with a sales value of 22 million dollars.

PHENOTHIAZINES
COMPAZINE (S. K. F.)
DARTAL (Searle)
PACATAL (Warner)
PHENERGAN (Wyeth)
SPARINE (Wyeth)
STELAZINE (S. K. F.)
THORAZINE (S. K. F.)
TRILAFON (Schering)
VESPRIN (Squibb)

MEPROBAMATE
EQUANIL (Wyeth)
MILTOWN (Wallace)

ALL OTHERS
ATARAX (Roerig)
FRENQUEL (Merrell)
NOSTYN (Ames)
QUIACTIN (Merrell)
SOFTRAN (Stuart)
SUAVITIL (M. S. D.)
SUVREN (Ayerst)
TRANCOPAL (Winthrop)
TRANQUINAL (Barnes-Hines)
ULTRAN (Eli Lilly)
VISTARIL (Pfizer)

In the interests of clarity it would be logical to discuss the areas under review in the order of their relative sales volume. Unfortunately, there is no clear line of demarcation between tranquilizers, sedatives, hypnotics and anti-convulsants. The spectrum of activity shows a gradual blending of tranquilizing activity into sedation, which in turn may lead to hypnosis or sleep and finally, in sufficient dose, into the lighter planes of anesthesia. Anti-convulsant activity may reside in any of the compounds. Therefore, there are points of similarity shared by tranquilizers, sedatives, hypnotics and anti-convulsants.

The word "tranquilizer" is generally used to designate a group of drugs useful in the treatment of mild or severe mental disorders and, within the term "mental disorder" we include the nervous stress to which almost all of us are subjected in our modern hectic civilization. Drugs which combat depression may also be included.

The words "sedative" and "hypnotic" were coined long before there were tranquilizers as we know them today. Consequently there is bound to be some overlapping between these terms, unless we redefine them in the light of present-day knowledge. The difference between these classes resides not only in the effects achieved, but also in the way these drugs are believed to act in the brain.

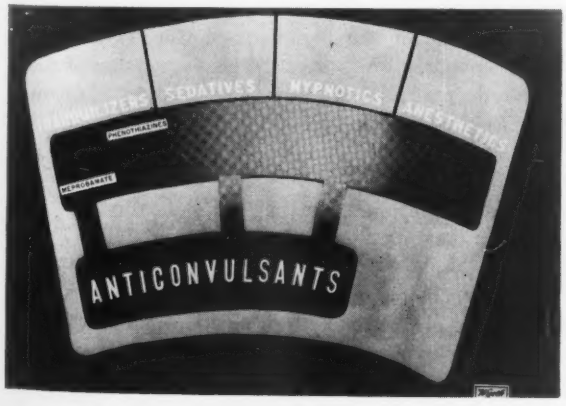
"Sedation" comes directly from a Latin word meaning a quieting or calming of the passions. This is exactly what a sedative does, but the tranquilizers accomplish this sedation in a different way from the old-fashioned sedative.

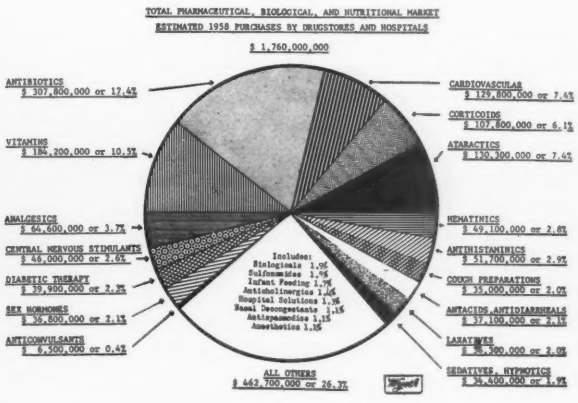
The bromides, barbiturates, and similar older sedatives have their predominant effect upon the outer layers of the brain or cortex. They depress mental acuity, produce a mental slowdown and, in sufficient dosage, produce sleep. At this point they become hypnotics—from the Greek word *hypnos* or sleep. The tranquilizers have their predominant action on a group of central and lower brain structures, including the thalamus, the hypothalamus, and the reticular formation in the brain stem. For this reason their primary effect is not on the higher thinking centers, but on the emotional centers.

The years 1953 saw the general introduction into medical practice of the Indian herb, rauwolfia. While not the oldest of tranquilizers (alcohol continues to occupy the role it has enjoyed since prehistoric days), rauwolfia serpentina marked the earliest milestone on the road which has led to today's multitudinous tranquilizers. This drug had been known for centuries and had been used for several purposes in India, including the control of mental illness and of high blood pressure. A description of the drug in an Indian journal led to a study of rauwolfia in several countries and the isolation of reserpine and other alkaloids which are contained in the natural drug. These medicaments are now being used principally in the control of high blood pressure and no longer play their major role in the tranquilizer field. Statistically they are, therefore, now classified as cardiovascular drugs. In a medical and biochemical sense, however, reserpine and similar drugs do belong in the tranquilizer field.

A second type of tranquilizer is represented by drugs such as promazine, chlopromazine, prochloperazine, and other members of the phenothiazine group. This group of drugs are derivatives of phenothiazine, first used as a worm remedy, which is still employed extensively in animal husbandry for deworming sheep. These drugs have many interesting properties. Various members of this group, in different degrees, are useful in treating hay fever and other allergies, in allaying excitement and controlling hallucination in the mentally ill, and in combatting nausea and vomiting. Some members are potent local anesthetics. They have so many different properties they almost defy classification. However, one of these applica-

(*Continued on page 518*)




TOTAL PHARMACEUTICAL, BIOLOGICAL, AND NUTRITIONAL MARKET
ESTIMATED 1958 PURCHASES BY DRUGSTORES AND HOSPITALS
$ 1,760,000,000
ANTIBIOTICS $ 307,800,000 or 17.4%
VITAMINS $ 184,200,000 or 10.5%
ANALGESICS $ 64,600,000 or 3.7%
CENTRAL NERVOUS STIMULANTS $ 46,000,000 or 2.6%
DIABETIC THERAPY $ 39,900,000 or 2.3%
SEX HORMONES $ 36,800,000 or 2.1%
ANTICONVULSANTS $ 6,500,000 or 0.4%
Includes:
Biologicals 1.9%
Sulfonamides 1.7%
Infant Feeding 1.7%
Antiholinergics 1.6%
Hospital Solutions 1.3%
Nasal Decongestants 1.1%
Antispasmodics 1.1%
Anesthetics 1.1%
ALL OTHERS $ 462,700,000 or 26.3%
CARDIOVASCULAR $ 129,800,000 or 7.4%
CORTICOIDS $ 107,800,000 or 6.1%
ATARACTICS $ 130,300,000 or 7.4%
HEMATINICS $ 49,100,000 or 2.8%
ANTIHISTAMINICS $ 51,700,000 or 2.9%
COUGH PREPARATIONS $ 35,000,000 or 2.0%
ANTACIDS, ANTIDIARRHEALS $ 37,100,000 or 2.1%
LAXATIVES $ 36,300,000 or 2.0%
SEDATIVES, HYPNOTICS $ 34,400,000 or 1.9%

Perfume Formulation

THE LILAC GROUP

BY J. R. ELLIOTT PERFUME-FLAVOR CONSULTANT

The lilac is one of nature's most fragrant flowers. Its hauntingly sweet springtime fragrance, which is known and beloved by everyone, may be exquisitely reproduced in perfumery. In spite of these favorable factors, lilac as a "solo" fragrance is rapidly declining in popularity on the American market, because of its increasing use as a mask for foul odors.

Lilac effects for this kind of masking work must obviously be made as cheaply as possible. The majority of them are simply shabby caricatures of the lilac fragrance. But, shabby or offensive, they are all plainly recognizable as lilac odors. The constant contact with these cheap lilac odors, and their association with such distasteful masking situations as public rest rooms, hospitals, vulcanized rubber and sanitary products, has spoiled the public's acceptance of an otherwise fine fragrance. Lilac, like pine, has become degraded to the point where it is synonymous with tawdriness.

Lilac fragrance oils, cheap or fine, are based on terpineol, which is inexpensive in even the finest quality. It is this price factor which enables the production of a cheap, but still recognizable, lilac odor. Phenylethyl alcohol and cinnamic alcohol are intimately associated with terpineol in the creation of the basic lilac note. In fact, a mixture of equal parts of terpineol, phenylethyl alcohol and cinnamic alcohol is a conventional starting point for the design of a lilac fragrance. Following these three chemicals, a lily background (linalool, hydroxycitronellal, ylang, etc.) and a jasmin effect (amyl cinnamic aldehyde, benzyl acetate, indole, etc.) are introduced to round out and "flower up" the composition. The principal determinant of the quality of a lilac effect is the quantity of jasmin absolute and rose otto that are used in the finished composition. Both of these materials are expensive.

In spite of its lack of popularity as a solo fragrance, lilac finds immense use in perfumery as a floral adjuvant and blender. Medium-priced lilac fragrance oils find wide application in almost every fantasy fragrance and in such unexpected situations as the lavender-fougere-chypre group. Depending upon the extent of their use, they serve to blend together the rough edges of a mixed fragrance, or to provide a smooth floral background.

The interrelation of the other flowers in the lilac group is quite apparent. Acacia is based on the anisic aldehyde note familiar in lilacs, combined with a sweet neroli effect. The single chemical body, Acaciol (the Schiff's base of anisic aldehyde and methyl anthranilate), strikingly demonstrates the acacia fragrance. The sweet pea is basically a "greened up" lilac with rose and neroli nuances. The single—but not too familiar—chemical, hydratropylidene acetone, made from hydratropic aldehyde and acetone gives an excellent representation of the sweet pea. Unfortunately this chemical is almost as irritating as its analogue, benzylidene acetone, and therefore is limited in use. The heliotrope is merely a lilac overshadowed with heliotropine, which by itself is highly characteristic of the heliotrope flower. Hyacinth is quite obviously an extremely heavy version of lilac with a deep jasmin and tuberose sweetness. Hyacinth compositions are often used to shade fancy lilacs.

LILAC

Following are the purpose classifications of the lilac components.

Basics. Terpineol, anisic aldehyde, anisic alcohol, para benzyl anisole, methyl ethyl hydroquinone, hydroxycitronellal, cyclamen aldehyde, anisalacetone, para methyl anisalacetone.

Blenders. Phenylethyl alcohol, hydratropyl alcohol, phenylpropyl alcohol, benzyl dimethyl carbinol, phenyl dimethyl carbinol, benzyl alcohol, tolyl alcohol (paramethyl benzyl alcohol), lauryl alcohol, linalool, amyl cinnamic aldehyde, Schiff's base of amyl cinnamic aldehyde and methyl anthranilate, benzyl acetate, benzyl propionate, tolyl acetate, tolyl propionate, anisyl formate, benzyl dimethyl carbinyl acetate.

Adjuvants. Aldehyde C-14 (Peach), paracresyl methyl ether, heliotropine, paramethyl cinnamic aldehyde, octyl isobutyrate, tolyl aldehyde, acetophenone, amyl salicylate, phenylpropyl acetate, civette absolute, indole, phenylpropyl aldehyde, "Syringa" aldehyde (paramethyl phenylacetaldehyde), alpha ionone, methyl ionone, ylang Bourbon, ylang absolute.

Fixatives. Paracresyl phenylacetate, cinnamic alcohol, musk ketone, musk xylol, vanillin, coumarin, benzyl salicylate, benzyl isoeugenol; the resins of Peru, benzoin and tolu.

Naturals. Jasmin, tuberose and rose absolutes; rose otto, neroli.

The perfume literature repeatedly quotes 7-methyl quinoline and tetrahydro 2-methyl quinoline, as having a "fine lilac note." The author has synthesized these two quinoline derivatives and has been unable to verify the claims of the literature. These chemicals show only a pentrating, peculiarly unpleasant odor, even on high dilution. Nothing in them could be even remotely described as "lilac."

LILAC E.037

45	Hydroxycitronellal
40	Terpineol
25	Cinnamic alcohol
15	Anisic alcohol
20	Phenylethyl alcohol
5	Hydratropyl alcohol
27	Indole 10% in DEP
8	Isoeugenol
3	Oil styrax
8	Linalool
15	Benzyl acetate
3	Benzyl propionate
3	"Cumin" ketone
2	Ylang absolute
5	Tolyl alcohol
1	Amyl salicylate
10	Benzyl alcohol
15	Benzyl salicylate

This E.037 is illustrative of a typical blending lilac used extensively in fantasies to provide a smooth floral background and erase "sharp edges," particularly where aldehydes have been used.

The following is a fancy lilac composition used in expensive fragrances.

LILAC ROYALE E.038

3	Linalool
15	Terpineol
12	Heliotropine
3	Phenylacetaldehyde
12	Benzyl acetate
9	Ylang absolute
18	Hydroxycitronellal
12	Cinnamic alcohol
15	Phenylethyl alcohol
1	Rose otto
5	Rose absolute natural
1	Tuberose absolute
2	Isoeugenol
5	Tolu concrete
5	Tincture ambergris
2	"Cumin" ketone
5	Jasmin absolute
125	

Shown below is a lilac suitable for cosmetics and other situations where discoloration is a problem. Note that it contains no indole or skatole.

LILAC FOR COSMETICS E.039

14	Hydroxycitronellal
4	"Cumin" ketone
40	Terpineol
1	Isoeugenol
22	Phenylethyl alcohol
10	Benzyl acetate
1	Phenylacetaldehyde
4	Heliotropine
4	Amyl cinnamic aldehyde
2	Hexyl cinnamic aldehyde
4	Anisic aldehyde
1	Benzyl dimethyl carbinyl acetate
2	Paramethyl acetophenone 10% in DEP
14	Cinnamic alcohol
3	Oil styrax
4	Linalool
10	Paracresyl caprylate
10	Benzyl isoeugenol
150	

A medium-priced and a very cheap lilac for soap are shown below.

MEDIUM-PRICED SOAP LILAC E.040

600	Terpineol
140	Amyl cinnamic aldehyde
100	Benzyl acetate
100	Linalool
75	Anisic aldehyde
35	Paracresyl phenylacetate
10	Isoeugenol
5	Paracresyl acetate
35	Phenylethyl alcohol
100	Benzyl salicylate
1200	

CHEAP LILAC FOR SOAP E.041

40	Linalool
40	Ionone AB for soap
40	Bromstyrol
50	Benzyl acetate
200	Heliotropine
10	Aldehyde C-14 10% in DEP
10	Paramethyl benzaldehyde
110	Terpineol
500	

Concerning lilac for industrial masks, the chemical indole, which possesses a thoroughly foul and nauseating odor by itself, acquires a remarkably floral and pleasant nature when it is incorporated in a lilac formula. Indole is practically indispensable in the creation of a good lilac reproduction. A surpris-

(*Continued on page 523*)

MODERN ASPRO-NICHOLAS PLANTS

BY FRANCIS CHILSON INDUSTRIAL CONSULTANT

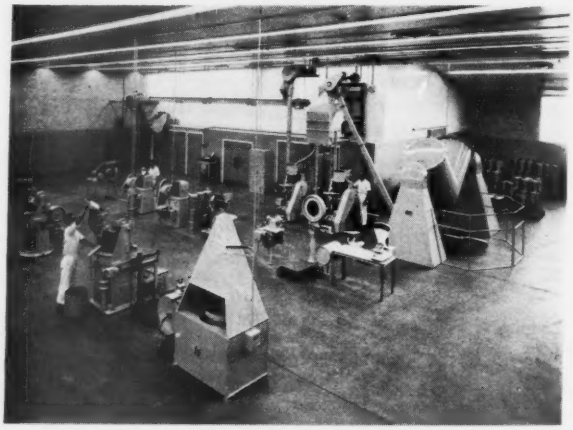
The first part of Dr. Chilson's discussion appeared in our March issue. This is the second and final article on the Aspro-Nicholas plants.

Before describing the way in which the principles already set forth were applied to the largest of the Nicholas factories, let me interpolate a word about the architects employed on both projects. The Australian project was handled by a first-rate industrial architect, D. Graeme Lumsden of Melbourne, Australia. His entire experience was obtained in building factories. In consequence he was easy to work with; he did everything possible to cooperate with my colleagues and me; he did everything possible to conform with the wishes of the Nicholas officials to keep within the original budget. The result was that the building was completed within a year—as fast as it could have been done in this country—and it was completed within the budget.

The English architect was just the opposite. Unfortunately he had had virtually no industrial experience, and this fact was not discovered by the director charged with the responsibility of selecting a qualified architect until after a contract had been signed with him. He not only refused to cooperate with me, but he even tried to oppose the wishes of my client! Finally the management cracked down on him and he was compelled to observe my recommendations regarding the size and site of the plant and its internal layout. The final result was that the English factory was three years in the course of construction; it cost a third more than the original budget—in fact, it cost as much per square foot as a factory of similar quality would have cost in this country even though English labor rates are one third of ours!

Thanks to the refusal of the management to change my recommendations, the English factory is just as efficient as the Australian plant. (My Aussie colleagues will never admit this of course!) Because the English plant is the largest of the Nicholas units and also because it is the parent company for a number of European, African and Indian subsidiaries, it required a much larger general office than the Australian plant and since, moreover, it really is the

General packaging floor of the Nicholas Pty. Ltd. plant in Australia.



The processing room of the Australian plant facing tableting room.

The tableting room of the Australian plant.

headquarters of Maurice Nicholas, the management decided to spend more money than the Aussies did on elaborate directors' suites and personnel facilities.

The design problem presented in both cases was similar. Because of topographic conditions and the size and width of the Australian site, it was necessary to use a two-and-a-half story facade for the offices, plant services and other contributory services. I would have preferred, had the lot been wide enough, to have placed all services in an L-shaped wing around two sides of the factory block. Since this was not possible, it was decided to place the service unit over the edge of the plateau, thus leaving all the flat space for the expansion of the single-story plant in two directions. Thus the factory and warehouse block are on a common level with the employee and factory services area. The offices are above this area and the garage and specialized engineering shops are below it. Hence the factory and all the people working in it, together with all related services, are housed on a common level. A strip of the site was reserved for isolation operations and one small chemical manufacturing unit was built in it. Because the office area is at present smaller than the factory services below it, it can be expanded to provide about 25 per cent more area before it becomes necessary to expand the factory services area below it. Then both factory services area and the office can be expanded all the way across the lot.

To save steel, the factory was built with a peaked roof. This provides at the valleys a minimum height of 14 feet and more than twice that under the peaks. The valleys are 130 feet apart, which provides large open areas unobstructed with columns. A sound-proof hung ceiling was built above the operating areas and the attic thus formed above it is used for ventilating and dust-collecting equipment and other building service equipment. As mentioned above, the processing and packaging departments form a line parallel with the warehouse area. In this way, as the factory expands, warehouse area will be absorbed and when necessary increments will be added to the warehouse area. In the plant all material handling is palletized and all packaging lines that justify it are automatic, or very nearly so. This plant produces proprietary, ethical and veterinary lines principally. One of the ethical items, a human food supplement—to give you an idea of scale—is produced at a rate considerably in excess of 3000 pounds daily. This would be a very good item even in this country.

The plant is beautifully landscaped. Ample sports grounds and parking lots are provided on the site. The plant has received wide publicity in Australia for its beauty and efficiency. In passing, I might mention that the plant contains control laboratories only. The research center—one of the most beautiful in the world—is located on the 200-acre estate of the late A. M. Nicholas about 20 miles away in the

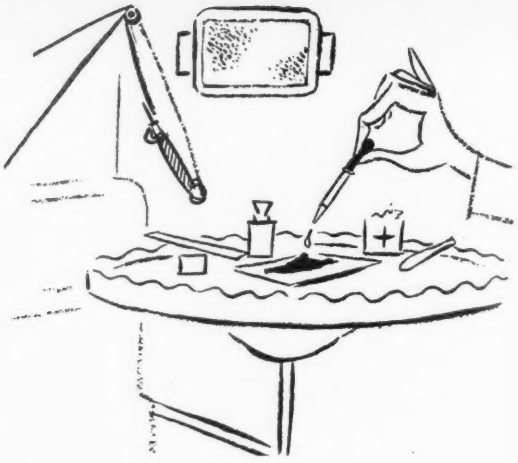
(*Continued on page 529*)

View of the packaging department of Aspro-Nicholas Ltd. in England.

The English factory, showing corner post pallets.

The Aspro tablet department. Note tote bins and absence of hoppers.

The circulation corridor through the Aspro-Nicholas Ltd. plant.



Glycerine
IN DENTISTRY TODAY

BY MURRAY BERDICK, PH.D., AND EVERETT G. McDONOUGH, PH.D.
EVANS RESEARCH & DEVELOPMENT CORPORATION

In an age of broad-spectrum antibiotics and an ever increasing number of highly versatile therapeutic combinations, few single materials have proved as valuable to modern dentistry as glycerine. Glycerine probably is more commonly used as a vehicle in medicinal preparations for internal and external use than any other liquid except water. And, with the advent of new dental products and new formulations, its applications are still increasing. Yet dentists, pharmacists and chemists acquainted with many official and nonofficial preparations formulated with glycerine often accept as commonplace the unusual combination of physical and chemical properties which make glycerine unique.

As a solvent in dental preparations, glycerine is miscible in all proportions with both water and alcohol. In various formulations containing water, the addition of glycerine may prevent hydrolytic breakdown of active ingredients. Glycerine has served as a solvent for various halides, alkalies, and some of the sulfonamides and their sodium derivatives.[26]

In addition to its primary solvent properties, glycerine has other properties which make it an excellent vehicle for drugs used locally in or about the mouth.[28] As described in *Accepted Dental Remedies*,[7] glycerine is clear, colorless and of thick syrupy consistency. It is used to adjust the viscosity of dental products, regulate water absorption and lower the surface tension of water. Glycerine may be odorless or have a slight characteristic odor. Its taste is sweet and compatible with many flavors, and it produces a sensation of warmth in the mouth. As a sweetening agent or vehicle used in place of syrups, glycerine is practically nonfermentable for 24 hours by the common oral microorganisms.[27]

To what extent have these properties of glycerine been employed in formulating today's dental preparations?

Liquid Cavity Seal

Of the many recent applications of glycerine, one of the most interesting is its use in a liquid cavity seal (Sevriton) inferred to be a glycerophosphoric acid dimethacrylate[6] having ". . . a special affinity for tooth structure." Although filling preparations generally have little or no such adhesive properties under usual oral conditions, a material capable of forming a strong bond could be used to seal pits and fissures against caries, to repair incisal fractures and to cement and leakproof bridges and inlays.

Of many acrylic resins tested, Sevriton appeared to be superior in its adhesion to enamel after 24 hours' immersion in water. Subsequently a number of tests were conducted until a mixture was selected which produced a hard resin with excellent bond strength for the "wet" dentin surface in five to eight minutes. The formulation consisted of Sevriton cavity seal liquid (0.4 g.), methyl methacrylate polymer (0.04 g.), benzoyl peroxide (2 per cent), methyl methacrylate monomer (0.10 g.), and Sevriton catalyst (0.05 g.). It was found that best results were obtained by applying the mixture to the tooth just prior to gelling. As the resin is slightly soluble in methyl methacrylate monomer, an acrylic mix applied over the adhesive resin results in a good bond.

Dental Therapeutics

The place of glycerine in the formulation of desen-

sitizing agents is primarily that of a solvent and bodying compound. As one of the many "accepted" and now established glycerine-containing products approved for use by the American Dental Association, a paste containing equal parts of glycerine, sodium fluoride and kaolin is proposed for treatment of hypersensitive dentin on the cervical areas of the tooth.[7] The use of this paste is contraindicated on freshly cut tooth surfaces.

Similarly, when the common complaint of a dull pain in the neck of the tooth presents itself, hypersensitivity can often be relieved by a formulation closely resembling that used to treat dentin.[2] By treating the gingivitis, detachment of the gingiva over the neck and the consequent gingival pathologic retraction are prevented. Symptomatic palliative therapy consists of local application of a paste of equal parts of a 33 per cent sodium fluoride solution, white clay and glycerine. Cervical damage, subsequent exposure of dentin and dentinal hypersensitivity can be controlled if treatment of the gingivitis is instituted early.

A number of dental preparations in use today have established their efficacy over several years. Among such glycerine preparations is Talbot's mixture, which is recommended in the *Merck Manual*[20] for treatment of gingivitis. This preparation consists of zinc iodide (24.0 g.), iodine U.S.P. (3.0 g), glycerine U.S.P. (16.5 cc.), and purified water U.S.P. to make 30.0 cc. The mixture is diluted with five parts water and applied daily by swab to the affected gums. The lips and cheeks are held away until the iodine has dried.

The solvent properties of glycerine are often of value in preparing antiseptics, such as methylrosaniline chloride. Similarly, in preparing cresolated formaldehyde, orthocresol (40 per cent) and formaldehyde solution (60 per cent), substitution of part of the formaldehyde solution by glycerine yields a clearer solution. Boroglycerine Glycerite, N.F., in addition to being regarded as a valuable vehicle[32] for other agents, has been suggested by Dobbs as a local antiinfective agent.[8] The same author suggests, as a topical antiseptic and astringent, a mixture of creosote (10 ml.), zinc chloride (7 g.), alcohol (45 ml.), glycerine (15 ml.), and water to make 100 ml.

The use of Tannic Acid Glycerite, N.F., as an astringent mouthwash (0.1 per cent solution), a topical astringent (2 per cent solutions) and hemostatic, has been recommended for some time, and various authoritative texts[7, 8, 20] include it among the standard preparations in dental therapy. To induce hemostasis, a two- to three-inch strip of 0.5-inch iodoform gauze is saturated with Tannic Aicd Glycerite, N.F., diluted with 10 parts water, packed into the socket, and left for a minimum of 72 hours.[20]

Mouthwashes have often been recommended for their cleansing action, pleasant aftertaste and alkalinity. Such is the case with the Alkaline Aromatic Solution, N.F., a preparation containing potassium bicarbonate, sodium borate, glycerine, alcohol, water and various flavoring agents.

Another glycerine-containing mouthwash contains alcohol SD 38B (18.4 per cent), Tween 20 (4.2 per cent, Atlas Powder Co.), glycerine (11.0 per cent), Duponol C (1.0 per cent, E. I. du Pont de Nemours & Co.), Hyamine 1622 (1.0 per cent, Rohm & Haas Co.), sodium dehydroacetate (2.2 per cent), water (57.5 per cent), and the balance in flavoring agents, etc.[25]

Topical Anesthetics and Obtundents

Of the various anesthetic ointments for topical dental use based on benzocaine, it has been reported[24] that one of the best bases formulated and tested is the following glycerine-containing preparation to which ethyl amino-benzoate is added to give a 35 per cent concentration of anesthetic in the ointment: Amerchol CAB (10 per cent), Modulan (2 per cent), stearic acid (20 per cent), glycerine (6 per cent), triethanolamine (2 per cent), water (60 per cent), and preservative as needed. *Accepted Dental Remedies* cites the use of glycerine in Waite's Topical Paste (Cook-Waite Labs, Inc.) which also contains tetracaine hydrochloride, refined benzalkonium chloride, barium salfate powder, methyl cellulose and distilled water.

Glycerine is also found to be one of the primary ingredients in obtundents for painful alveoli following tooth extractions. Dobbs[8] noted that the following preparation can be applied directly to the tissue or on a gauze sponge inserted loosely into the alveolus and changed each day: guaiacol (24 ml.), glycerine (24 ml.), balsam of Peru (45 g.), and yellow wax (4 g.). Another well-established official preparation, also noted in *Accepted Dental Remedies*, is Guaiacol, N.F., diluted with an equal volume of glycerine. This mixture is used locally for alleviation of postoperative pain arising from extraction of teeth and related procedures. In treatment of a "dry socket," it is suggested[20] that a two- to three-inch strip of 0.5-inch iodoform gauze be saturated with the mixture and

(*Continued on page* 533)

SHAMPOOS*

BY J. M. LONGFELLOW COLGATE-PALMOLIVE COMPANY

The formulation of shampoos has certainly been the area of toiletries formulation to feel the greatest impact from the introduction of syndets. The shampoo market over the past 25 years presents a fascinating opportunity for a study of the interplay of technical developments with marketing economics and personal grooming habits: the rapid growth of the shampoo market to its 1957 retail level of $146,680,000 has been coincident with the introduction of syndets into shampoos, and one may well ask whether this growth has not been largely due to the availability of technically improved products made possible by synthetic detergents.

The impact of the availability of syndets on the technical aspects of shampoo formulation and, particularly, of shampoo evaluation has been equally or even more impressive. The measurement of the improvement in a shampoo's properties and performance due to alterations in its composition is a very complex problem involving many subjective judgments. Efforts to devise scientific, that is, reproducible and precise, methods for the laboratory evaluation of shampoos have been closely associated with the investigation of syndets as shampoo components; this problem is responsible for the increasing degree of accuracy with which we can make technical evaluations of shampoos.

The best estimate available of the amount of anionic surfactants used in shampoos is that of Pacifico and Elder for the year 1954.[1] Their estimates for the year 1954, in which the retail dollar volume was $116,920,000, is given in the first column below, and in the second column is a figure derived simply by adding 25 per cent to their estimate to give a very rough estimate of the increase through 1957, when $146,680,000 was spent for shampoos.

	1954 Millions of pounds	25% Growth Millions of pounds
Lauryl sulfates	5.9	7.4
Alkyl monoglyceride sulfates	1.3	1.6
Soap	1.9	2.4
		(100% Active basis)

Such a cavalier use of their data as that above is, of course, not warranted for any but a very rough estimate of the volume of these materials going into shampoos: it ignores changes in retail price, changes in market share and changes in formulation, which have certainly occurred since 1954.

Nevertheless, none of these omitted factors will change the fact that the alkyl sulfates are the backbone of the shampoo industry.[2] As these anionics strove for and won dominance in the shampoo field, and as they strive to maintain it, the shampoo formulator has been faced with frustrating but intriguing problems in the scientific evaluation of shampoo properties, and the correlation of technical evaluation with consumer acceptance. Undoubtedly, many of us once naively assumed that detergent efficiency was most important to consumer acceptance of a shampoo,

*Presented at the 45th Annual Meeting of the Chemical Specialties Manufacturers Association, Inc., December 1958.

and certainly it was an obvious factor for technical testing. Experience has shown us how complex the problems of technical evaluation, of consumer acceptance, and of their interrelation are. Dr. Powers' restraint in saying, "A successful shampoo may be defined as a product having some cleansing and foaming action which leaves the hair soft, lustrous, and manageable,"[2] is greatly appreciated by cosmetic chemists with experience in this field.

The techniques of laboratory evaluation that have been reported in the literature are now too numerous to review in any detail or with any degree of critical comparison. Some reported techniques for evaluating shampoos by methods related to their use on hair are the following:

FOAM AND FOAM STABILITY

Middleton:[3] latherometer; butanol as load.
Fredell and Read:[4] "titration" of standard-soiled heads of hair with shampoo to persistent foam end point.
Barnett and Powers:[5] latherometer: artificial sebum, sweat and various lipoids as load.

DETERGENCY AND CLEANSING ACTION

Barnett and Powers:[6, 7] Removal of petroleum ether-soluble from wool yarn spun in the grease.
Ester, Henkin, and Longefellow:[8] Removal of chloroform soluble from hair clippings.

CONDITIONING ACTION ON HAIR

Henkin, Mills, and Ester:[9] Electrostatic charge on hair.

LUSTER

Mills and Thompson:[10] Photoelectric measurement of luster of hair after shampooing.
Fredell and Read:[4] Visual observation of deposits on hair tresses after shampooing and air drying.

In addition to such techniques as the above list of specialized methods adapted to evaluating shampoos on hair or closely related substrates, the evaluation of shampoos also includes the following factors whose technical measuremnt is not greatly different from their estimation in evaluation of other surfactant products: surface and interfacial tension, wetting action, *p*H, soap and syndet analysis, free fat and ash analysis, viscosity (rheological properties), toxicities (ingestion, dermatological, corneal), and preservation against microbial deterioration.

Selling price and cost per application are, of course, also important to the formulator in his evaluation of a shampoo and, indeed, are an important factor in the Consumer Reports on shampoos.[11]

Among all the technically evaluable factors important to shampoo performance, we cannot list a factor that is universally regarded as of paramount importance in a shampoo's success, namely, fragrance. The fragrance of a shampoo in the package and as it is used, and the fragrance clinging to the hair after its use are among the three probably most important attributes in a shampoo's success: foam, fragrance, and finish.[12]

The correlation of the technical evaluation of a shampoo with consumer acceptance is fraught with difficulties. Some degree of detergency is certainly required, but great effectiveness here probably does not contribute much to the consumer's regard for the product. Good foam is certainly now a *sine qua non* for shampoo acceptance. The finish or manageability properties, such as ease of hair combing, electrostatic charge on hair, limpness of the hair, and the like, can perhaps be measured with some degree of reproducibility and accuracy, but there is undoubtedly great individual variation in each consumer's preferences for hair condition, since her hair type and her coiffure choice will determine what hair condition is best suited to her. When, to these problems, are added the factors of the consumer's reaction to packaging, to advertising, to the "product image," to the "corporate image"—and on down the list—the cosmetic chemist may indeed evoke sympathy in his attempt to erect a firm technical foundation for a successful shampoo.

Consideration of the techniques of formulating shampoos having definite physical properties and forms returns us to somewhat firmer ground. It is usual as well as convenient to divide shampoos into three major classes: clear liquids, lotions (opaque liquids) and creams ("pastes"). Pacifico and Elder[1] reported they found the active agent content of a typical clear shampoo to be 23 per cent, of a lotion, 18 per cent and of a cream 25 per cent. These values are well within the range of published formulas, but the latter show very wide ranges indeed. A very quick comparison of the composition of three types may be made on the basis of rudimentary formulas published some years ago,[13] in which commercial lauryl sulfates, are used in each case:

CLEAR LIQUID	
Triethanolamine lauryl sulfate commercial solution	35.0%
Sodium alginate	2.5
Water	62.5

LOTION	
Sodium lauryl sulfate, commercial solution	30.0%
Magnesium stearate	1.0
Polyvinyl acetate (10% solution)	20.5
Methyl cellulose	9.0
Water	38.0
Lanolin	0.5
Glyceryl monolaurate	1.0

CREME	
Sodium lauryl sulfate, commercial solution	50%
Sodium stearate	8
Water	41
Lanolin	1

I hope it is not necessary to say either that none of

(*Continued on page 538*)

Competitive
DRUG RESEARCH

With the announcement of the availability of hydrochlorothiazide by Ciba (as "Esidrex") and by Merck Sharp & Dohme (as "Hydrodiuril"), the pharmaceutical and commercial position of chlorothiazide ("Diuril") undergoes drastic change. Instead of a deserved patent monopoly, earned by years of expensive research, Merck will now compete with one other, and possibly four others, in the sale of a chorothiazide derivative that is said to be ten times as potent as the original compound.

Chlorothiazide, estimated by noncompany sources to have attained a $24-million volume in its short commercial existence, was the major result of a research program initiated over 15 years ago to gain information about kidney function. Better knowledge of excretion mechanisms led to the development of probenecid to inhibit the excretion of penicillin, but increase the excretion of uric acid. The study naturally turned to diuretics, especially after experiments in Boston showed that sulfanilamide derivatives might be applicable. After establishment of pertinent fundamental physiological data, specifications for a desired compound could be set up. These included simultaneous excretion of sodium and chloride ion during diuresis to counteract salt retention in hypertension. Small intermediate successes in the research program indicated the feasibility of the goal. "Diuril," the culminating compound, proved to be effective in treating both edema and hypertension, including congestive failure, nephrosis and nephritis, liver diseases, toxemia of pregnancy and premenstrual tension. It is active orally, unlikely to cause metabolic acidosis, is well tolerated and has low inherent toxicity. Patients do not develop a tolerance to the drug.

Chlorothiazide is 6-chlor-7-sulfamyl-1,2,4-benzothiadiazine-1,1-dioxide, made by condensing 4-amino-6-chloro-*m*-benzenedisulfonamide with formic acid. When the disulfonamide is condensed with formaldehyde, or the chlorothiazide is chemically reduced, the 3,4-dihydro compound is produced and this is hydrochlorothiazide.

Hydrochlorothiazide is now claimed to be the most potent diuretic available, exceeding the activity of even the most potent injected mercurials. It is effective in one-tenth or less of the dose of the original unreduced compound. In hypertension, both compounds are most useful in enhancing the effectiveness of hypotensive drugs, permitting reduced dosages. Some investigators have reported that the newest compound may be the more effective in reducing high blood pressure and may produce even less potassium excretion.

If present clinical evidence is verified, it seems likely that the newer hydrochlorothiazide will in time largely replace the original chlorothiazide, and there is good reason to believe that these compounds will have an expanded market. At the same time, however, the company that made the original research investment will no longer be alone and will have to share with others.

This is almost an old story, certainly one that has been frequently repeated. The better the new drug, the more it fills a need, the quicker will competition appear. Pharmaceutical competition is to a large extent competition between research departments, and it is competition fostered, not reduced, by patent monopoly. Without a patent, a new drug could be copied and competition would be based solely on merchandising methods. The existence of a restricting patent forces the development of improvements not covered by the patent, and the new product can gain a foothold because it has one or more points of superiority.

The original production of cortisone, for instance, was soon followed by others, then by improved hydrocortisone, and then by prednisone. The real advantages of this last steroid permitted the carving out of a substantial part of the available market, but the

(*Continued on page 538*)

Packaging and Selling

Lanolor, by Squibb S.p.A.,
Italian affiliate of E. R. Squibb & Sons, which has been introduced in Europe. The valve and foam actuator are by Solfrene S.p.A., of Milan, Italian licensee of the Risdon Manufacturing Company. The plastic cap is mauve, matching the actuator, and the one-piece three-ounce container is made of aluminum.

℞ *Protection*

The protection of family health is the single goal of America's giant pharmaceutical industry. Its thousands of modern formulae demand the finest in protective packaging. Sheffield collapsible metal tubes are the choice of leading manufacturers; their quality, safety, utility are without equal.

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NEW FORMULATION SERVICE . . . most up-to-date of its kind in America, to help fillers and marketers develop new aerosols, modernize older ones, profitably!

ALL REPRESENTATIVES TECHNICALLY TRAINED . . . you'll enjoy dealing with men who know aerosol markets, understand production problems.

ON-TIME DELIVERY of the quantity you need, from a nationwide network of distribution points.

YEARS OF EXPERIENCE back the high quality of UCON Propellants . . . and the technical assistance now available to you.

CARBIDE has long been active in emulsion technology, surface-coating technology, silicones, solvents, and the manufacture and handling of gases . . . all associated with the aerosol industry. Thus, UCON Propellants are a logical extension of CARBIDE's research and development programs.

For more information, write: UCON Propellants, Union Carbide Chemicals Company, 30 East 42nd St., New York 17, N. Y. Call, write or wire us, today! Attention, Dept. B-4.

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UCON Propellants are available in five grades

UCON Propellant 11 Trichloromonofluoromethane
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UCON Propellant 22 Monochlorodifluoromethane
UCON Propellant 113 Trichlorotrifluoroethane
UCON Propellant 114 Dichlorotetrafluoroethane

GLASS CONTAINERS FOR PRESSURIZED PRODUCTS*

BY A. R. MARKS WHEATON PLASTICS COMPANY

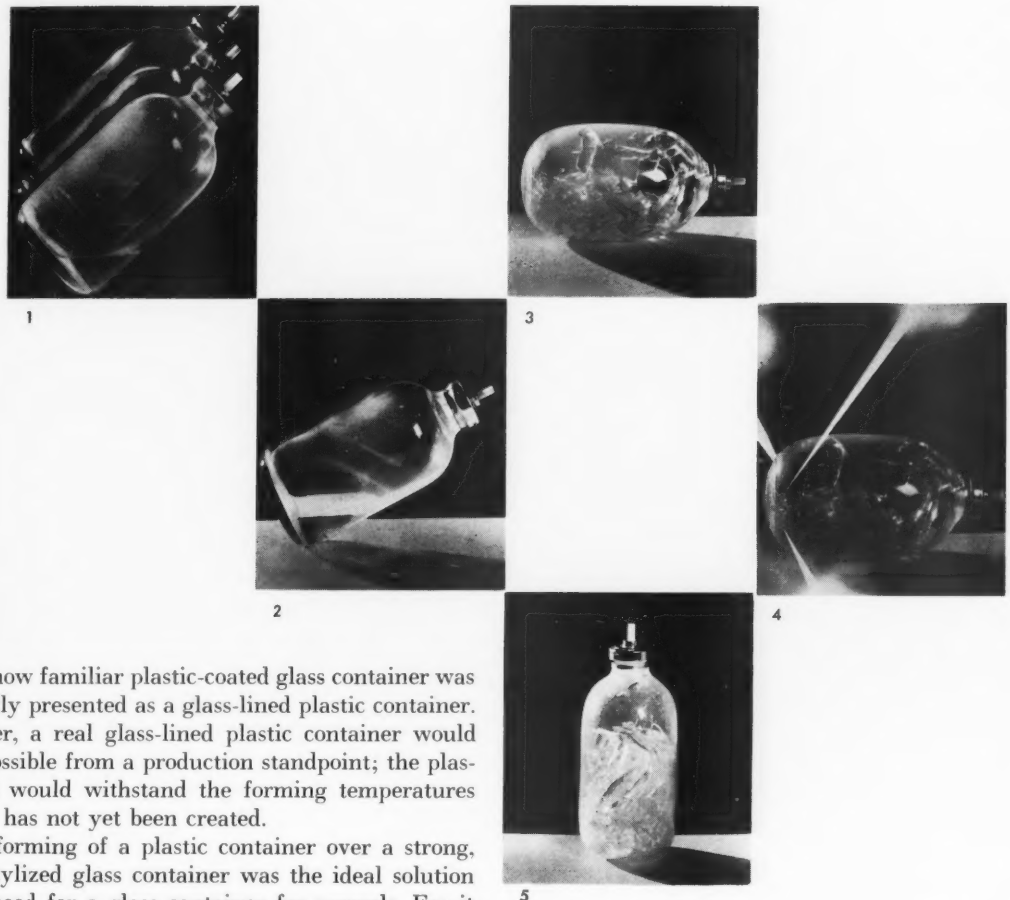


Figure 1. From top to bottom: (1) the bottle is dropped; (2) the impact causes breakage; (3) the plastic expands and balloons to hold the released pressure; (4) the gases are gradually vented; (5) the bottle returns to its original form.

The now familiar plastic-coated glass container was originally presented as a glass-lined plastic container. However, a real glass-lined plastic container would be impossible from a production standpoint; the plastic that would withstand the forming temperatures of glass has not yet been created.

The forming of a plastic container over a strong, inert, stylized glass container was the ideal solution to the need for a glass container for aerosols. For it provides the advantages of the best properties of both containers, utilizing the combination to minimize the individual disadvantages of each.

In the first place, glass is inert. With a few exceptions such as hydrofluoric acid; there is no material which cannot be satisfactorily contained in glass. This statement is backed by thousands of years of experience and the millions of products contained. Moreover, glass is strong. Fibers of 18 thousandths of an inch in diameter have a tensile strength of 115,000 pounds per square inch, a compressive strength of 290,000 pounds and a modulus of elasticity of 10.2 x 10.6.

Dr. Fay V. Tooley states in *The Handbook of Glass Manufacture*: "Actual measurements of the strength of glasses are difficult to obtain due to the market reduction in strength caused by surface flaws. These flaws may be invisible and may readily be formed by the attack of atmospheric moisture on the glass surface. The spreading of fractures is affected by the nature of the surrounding atmosphere, acetic acid vapors, water vapor, and CO_2 (carbon dioxide gas) all increasing the rate of propagation."

Now, add to the glass container the plastic coating. The surface is protected from scratches and flaws—flaws which develop only in container handling. There is no attack from atmospheric moisture, water vapor or carbon dioxide. The pristine surface of the glass is permanently sealed and protected from

*Presented at the Packaging Association of Canada, March 1959.

WE RECOMMEND NITROSOLS in PLASTIC COATED Wheaton GLASS

This is a container subjected to 350 pounds hydrostatic pressure before bursting. An adequate margin of safety is assured above the recommended gassing pressure.

YES . . .

Nitrogen, Carbon Dioxide, Helium, Argon or any compressed gas can safely be used in plastic coated glass containers. The low potential energy of these gases permit a pressure of 90 pounds. By observing a minimum headspace of 25%, maximum extraction of product is assured. Container sizes can range to 36 ounces.

Our chemists will be pleased to advise you on your specific problems.

Plastic Coating

- **improves pressure retention**
- **prevents weakening scratches**
- **adds resistance to breakage**
- **prevents flying particles on breakage**

WHEATON PLASTICS COMPANY
MILLVILLE, NEW JERSEY

Shown here are actual photographs illustrating a typical sequence of breakage. (1) The bottle is dropped, (2) impact causes breakage, (3) the plastic expands and balloons to hold the released pressure, gradually venting the gases, and (4) returning to its original form. Only Wheaton containers will perform in this safe way.

1

2

3

4

abrasion and strength-reducing elements.

The fact that glass is frangible is a drawback. But, add to the glass the plastic coating: with 2000 pounds of tensile strength and an elongation factor of 400 to 500 per cent, the tough, resilient rubbery nature of the plastic cancels the frangibility of the glass. Here is the perfect mating of materials to produce a container of strength, character, beauty, color and warmth.

To recapitulate, the pristine glass surface is protected from marring and scratching. This in itself improves the pressure retention factors of the package. Although glass will break, the coating on the bottle makes it break-resistant, cushioning the forces that would normally break unprotected bottles. Finally, should the bottle break because of excessive impact, the resilient coating retains all of the glass, preventing fragmentation.

Figure 1 illustrates the performance of this container with actual photographs of a typical sequence of breakage. When the bottle is dropped, the impact causes breakage; the plastic then expands and balloons to hold the released pressure, gradually venting the gases, and finally returns to its original form.

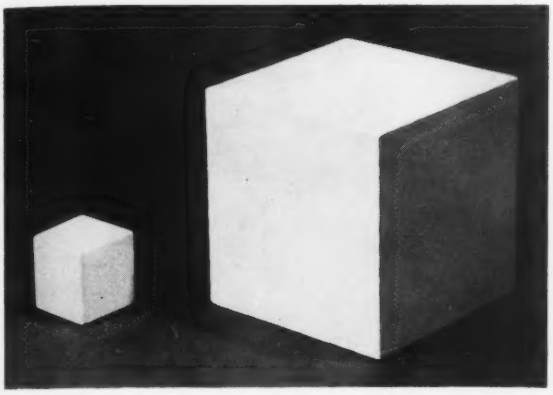


Figure 2. The smaller cube represents one unit of liquefied propellant which, without a restricting container, would expand to the size of the larger cube as a vapor, that is, to 25.2 cubic times the volume of the smaller cube.

This expansion of the plastic jacket in relation to expanding gases is an exclusive feature of the Wheaton package. Where the fluorinated hydrocarbons or liquified propellants such as Freon, Genetron, Isotron and Ucon are used to pressurizé these containers, it is recommended that a maximum pressure of 25 pounds at 70° F. be observed. Where compressed gases such as nitrogen, carbon dioxide, argo or helium are used, 90 pounds of pressure is recommended.

The reason why pressure is restricted to 25 pounds in one case and 90 pounds permitted in another must be explained. It has been a major fallacy in determining potential hazard to use pressure as the sole criterion. Granted that pressure alone can distort various containers, rendering them unmarketable, pressure per se is not the major factor in the glass container, although it has its relative importance. Since the glass container has pressure retention characteristics far superior to most other containers used for pressure packaging, the factor to consider above all is the volume that will be occupied by the expanded propellant at atmospheric pressure and ambient temperatures.

Consider first the liquified propellants. To illustrate, let the smaller cube in Figure 2 represent one unit of liquified propellant. Without a restricting container such as a glass bottle, this unit of liquified gas will expand to occupy as a vapor the space represented by the larger cube, that is, 25.2 cubic times more than the original cubic unit.

The following table provides a realistic application. This is a medium-pressure aerosol containing 50 per cent propellant and 50 per cent product. The propellant is Freon 12-11 in a 1:1 ratio. The capacity of the container is 140 millilitres, headspace 15 per cent, pressure 35 pounds per square inch at 70° F. The expanded volume is 990 per cent.

	Aerosol medium pressure 50% product & propellant Freon 12-11 (1:1)
Capacity	140 ml.
Headspace	15%
Pressure	35
Expanded volume	990%

This next table illustrates a typical low-pressure aerosol. There is again 50 per cent product and 50 per cent propellant. In this case, however, the propellant is Freon 12-114 at a 1:9 ratio, resulting in a pressure of 20 pounds per square inch at 70° F. Here you will note the expanded volume is 770 per cent.

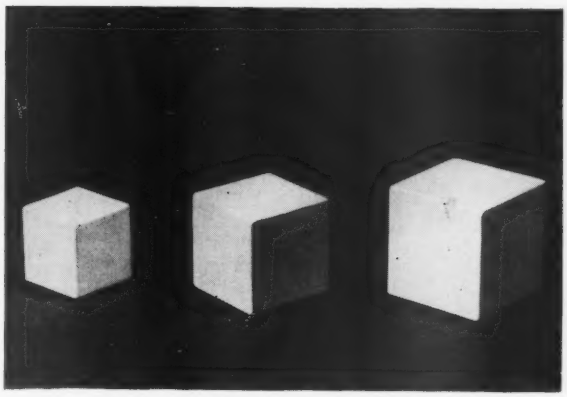


Figure 3. The small cube represents a container filled with compressed gas at 90 pounds of pressure. If impacted with sufficient force to break the glass, the container expansion would be 100 and then 200 per cent, represented by the second and third cubes.

	Aerosol low pressure 50% product & propellant Freon 12-114 (1:9)
Capacity	140 ml.
Headspace	15%
Pressure	20
Expanded volume	770%

(*Continued on page 539*)

424...408...369. These three bottles are likely candidates for any popularity contest because they meet all requirements so admirably. They have both beauty and versatility as well as particular appeal to cost minded merchandisers. All can be supplied plain, or decorated to your specifications.

GLASS STIMULATES SALES

CARR-LOWREY GLASS CO.

Designers and manufacturers of fine glass containers

Factory and Main Office: BALTIMORE 3, MD. • New York Office: 415 MADISON AVE. • Chicago Office: 1572 MERCHANDISE MART

Packaging and Selling

All of a sudden everybody is excited about the Company Image. This excitement is a bit more prevalent in the retail field, where there has always been a keen understanding of the importance of store personality and where, in fact, the successful, outstanding retailer has always been noted for a vivid personality.

As in the retail trade, the ambitions and adventures of the last several years have lead many companies to stray far afield from the image or personality which originally established the success for that company. Two surveys have recently been made by marketing organizations with the express purpose of examining in detail the consumer image of several cosmetic companies. To put it a little more plainly, in these surveys panels of women were asked carefully prepared questions concerning these particular cosmetic companies.

The surveys brought out in a startlingly vivid way how shockingly far astray a company can go, or how completely at variance the customers' opinion of the product or company may be with what a company is trying to do through its advertising, packaging, and the like.

For instance, one very large cosmetic company that prides itself on quality products, a fashion status and alert research, was rated as interesting to the type of women who read movie magazines and movie fans.

Another cosmetic company that takes considerable pride in its success over the last four or five years and which has been an important advertiser on television, drew no opinion at all from these consumers. This was an extraordinary example of failure to identify a personality for the company or the product in the woman's mind.

A third company, highly respected in this industry, doing a substantial business and spending a great amount of money, was voted as a very confusing company with a lot of unrelated confused products, none of which had any particular significance to the woman questioned.

Still another company, rated high in industry circles, was voted a nice old-fashioned company appealing primarily to middle- aged and older women. This is shockingly contrary to the aspirations of this company and the type of business it believes itself to be doing.

Three other companies were clearly identified as vivid personalities with an image pretty clearly defined in line with the company's advertising, packaging, distribution and so forth. One company, a fashion leader, was vividly and directly etched in regard to its fashion leadership, its appeal to well-to-do women who are fashion leaders or fashion followers, and the fact that its products were excellent quality but stable without much research.

These surveys, it seems to us, bring up vividly the question of how many companies really know where they are going, whether they are spending their advertising money to some extent at cross purposes and whether their distribution is at variance with the way the consumer thinks of their products. For instance, each of these surveys asked the panel women what kind of women, in their opinion, could be expected to be most likely to use the products of the listed companies. Among these classifications were age groups (such as grandmother, middle-aged women, young housewife, teen-ager), and also economic groups (such as rich, well-to-do, middle-income and poor) and occupational groups (such as housewife, secretary, business woman, factory worker and club woman).

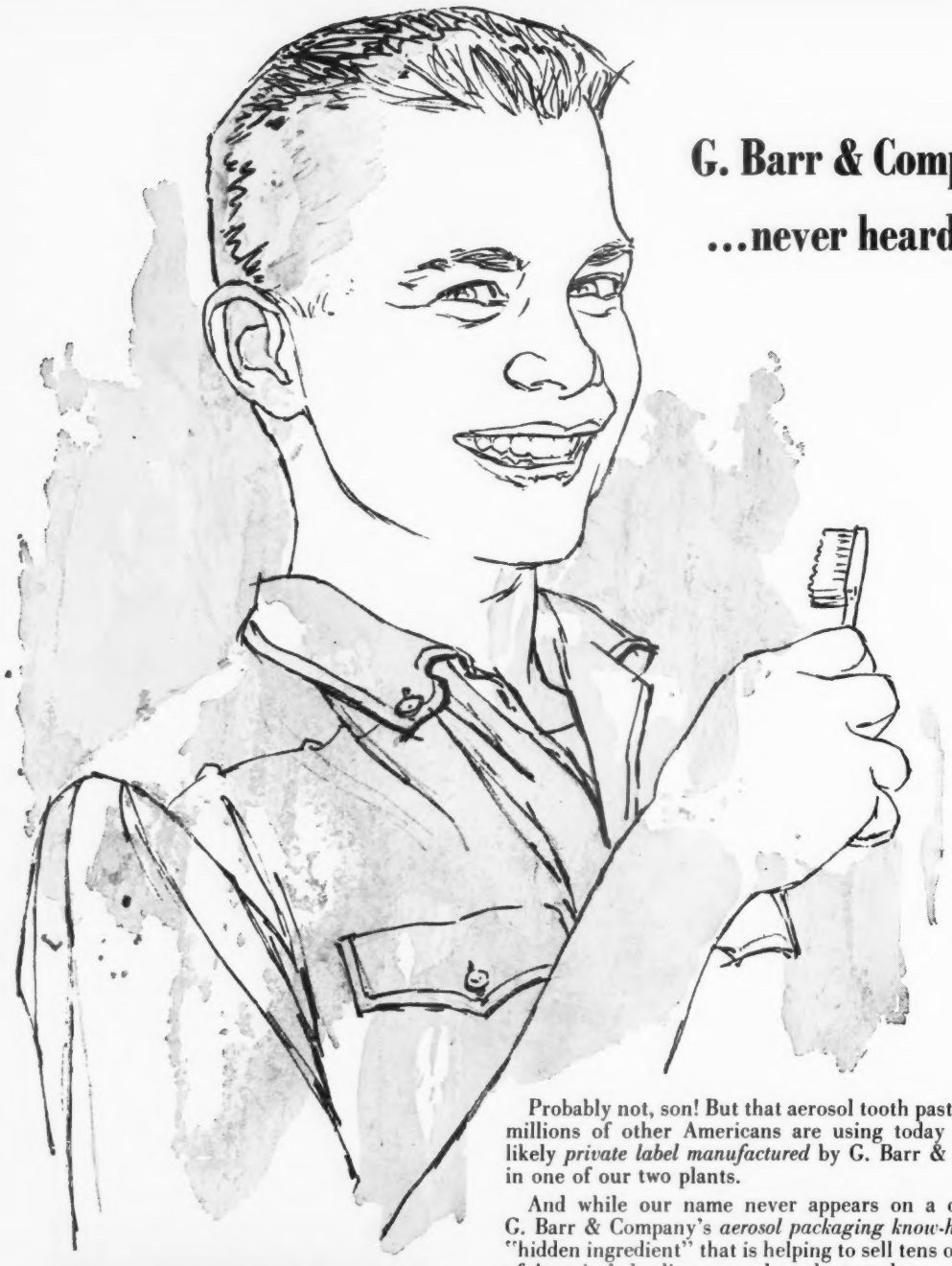
A careful study of these reports on the opinion of American women as to what kind of women enjoy the various brand names of our trade has made very clear to us that the publication of surveys of this sort would be a shocking revelation to the industry as a whole and an even more shocking revelation to about half the companies in it. Certainly, a part of the industry is far adrift in media selection, in advertising appeal and in happy day-dreams of the kind of companies they are operating.

It is true in the whole manufacturing field, and certainly true in this industry, that a high percentage of business management has never considered what a company image is and whether it has any importance to a given company. In fact, a fairly substantial number would not know what you were talking about if you mentioned such a thing as a company image, and would dismiss the question with an impatient shrug.

And yet, some sensible questions could be asked, namely:

Can a company have a poor or a confused or a misleading company image even though it is spending as much as a million dollars in its advertising campaign?

Can the way in which companies spend their advertising money, that is, which particular magazines they select or the use of television and the particular audiences they select, create a totally different company image from those they are unwittingly striving to establish? For instance, one company may be striving to establish a prestige personality, another a mass appeal for quality and a low price.



G. Barr & Company?

...never heard of them!

Probably not, son! But that aerosol tooth paste you and millions of other Americans are using today was very likely *private label manufactured* by G. Barr & Company in one of our two plants.

And while our name never appears on a container, G. Barr & Company's *aerosol packaging know-how* is the "hidden ingredient" that is helping to sell tens of millions of America's leading aerosol products today.

The hair spray, room deodorant, shaving cream, spray antiseptic, car polish, spray cologne and scores of other famous aerosol products found in homes all over America were in many instances developed in our research laboratories and private label manufactured by us.

Have you heard the G. Barr & Company story? Get the facts today.

G. BARR & COMPANY

Private Label Aerosols

3601 SOUTH RACINE AVENUE CHICAGO 9, ILLINOIS

Can a temporary advertising success hide a completely ineffective, misleading company image which will eventually overtake that company with disaster?

What effect has poor quality in products, a flood of too many products, too many promotions, gimmicks and gadgets, cut price sales, etc. had on a company image?

How does the pattern of distribution effect the company image?

It seems to us that questions like these will become increasingly important as competition intensifies. That this is not an idle opinion is made very clear, so far as cosmetics go, by the appallingly sudden decline and fall of several old, established and formerly successful perfume and cosmetic companies, within the last two years. It really is shocking how these companies that at one time had the appearance of prosperity and respected acceptance by the consumer and the trade could, in so brief a time, collapse or be sold into some merger, thereby losing any significant position.

So far no surveys have been made on company images held by the retail trade. This will probably happen, because there is a strong tide of opinion toward recognition of the retailer and the point of sale as an essential link in the entire chain of merchandising, which includes, of course, consumer advertising. Some companies that are smugly satisfied with their own opinions of their status in retail relations may well be astounded at their images in the minds of buyers, merchandising managers, small store owners and, very particularly the salesgirls behind the counter.

A great deal is known about the way in which different colors affect people, particularly as they are used in packaging and display material.

The latest word comes from an expert, that is, Howard Ketcham, who has been doing color consulting work in industry and recently has worked with several drug chains, in a new book, "Color Planning For Business & Industry," published by Harper & Brothers, New York City. Here are the color reactions.

Red excites.
Peach and pink appetize.
Orange activates.
Yellow cheers.
Green refreshes.
Blue cools and subdues.
Purple depresses.
Magenta stimulates.

A British court recently refused to allow British druggists to restrict sales of proprietary medicines to pharmacies.

These British druggists claim that it was not safe for an "unqualified person" to sell any medicine and that a chemist should be available to advise purchasers on use of medicines.

According to the court, opportunities to offer advice would be "negligible" and the removal of the restriction against sales in non-chemist shops would not deprive the public of any substantial benefit or advantage.

It seems to us that many of the things that are taking place in drugstore evolution today are moving the druggist away from a monopolistic position in proprietary sales rather than toward it. We refer, for instance, to such things as self-service in drugstores and to the expansion of some stores into a form of drug supermarkets.

Sales of retail druggists in 1958 were at a record high of $6,700,000,000—a 3.7 per cent increase over 1957. This boost took place without the "benefit" of the flu epidemic of the previous year.

Over 750 million prescriptions were filled last year and 90 per cent of these were for products not available 10 years ago.

The retail drugstore is holding its traffic even against the rising popularity of the supermarket.

All this, from a talk by Charles Beall, vice-president of McKesson & Robbins.

According to a recent survey by a Scripps-Howard newspaper, there was a decline in the sales of certain cosmetic products in supermarkets between 1952 and 1958.

This survey covered twelve cities and included 27 health and beauty items in grocery stores.

Sales declines for the grocery stores included tooth powder, shaving cream, sun tan preparations, headache remedies and laxatives.

The time is coming when the pharmaceutical companies will have to establish a marine division. They have expanded vigorously into animal health and plant health, but they have sadly neglected that important part of our economy, marine life.

This thought was suggested to us by a recent news release from the State Conservation Department stating that "X" disease in oysters is today becoming a major problem in the oyster industry. This epidemic has almost wiped out the Canadian oyster industry and the disease is threatening as far south as the Virginia coast.

We have not quite reached the point in research where we know how to feed growth stimulants to lobsters, although the recent price of the baby one-pounder ought to be a tremendous stimulant to research.

Nevertheless, it should be the pharmaceutical industry that attacks the organisms causing disease, decay and corruption, no matter where these organisms and their results are found.

Nail enamel, during the last 10 or 12 years, has been probably the most puzzling cosmetic in the entire range of cosmetic products.

We use the word puzzling in a marketing sense. During this period the entire cosmetic industry has had a tremendous growth, nearly doubling in the amount of products consumed by the American public. During this period there have been some dynamic product growths, notably in every branch of hair treatment and in such products as deodorants. This period has also seen face creams reverse a downward trend and again start an upward cycle. Above all, during this period, there has been a truly substantial expansion in the use of makeup, not only from the viewpoint of the quantity used and the increase in the number of women using makeup, but in the spread and variety of new makeup products that have appeared on the market.

Yet, in spite of this substantial growth in the entire field of make-up, there has been apparently a declining market in nail enamel. This decline has taken place in the number of dollars spent for nail enamel because there has been a wide move into the smaller sizes in the variety stores. It also appears, from many marketing surveys, that there has been a declining number of women using nail enamel and a decline in the frequency of use by those who still decorate their nails.

A comparison with the commercial status of nail enamel today as compared with 20 or 25 years ago is revealing and disturbing.

Twenty-five years ago nail enamel was an important and thriving part of the cosmetic industry. We then had the three brand division of Northam Warren largely dominating the market, and yet, there were many other flourishing smaller companies.

The three divisions of Northam Warren were Peggy Sage, which held an important position in department store distribution with a style and fashion presentation; Glazo, for which the company tried to establish a middle range image, and which at that time had quite an important position in the drug chains and in those general retailers just below the top fashion and prestige retail establishments; and Cutex. Cutex was then a dominating brand in the entire industry and the dominating brand of the nail enamel field with distribution in every branch of the industry, although already it was beginning to move heavily over into the variety stores.

Along with these three brands of Northam Warren, was Barbara Bates, a department store distribution; La Cross, a thriving company in the same distribution; and Lady Lillian of Boston, which operated primarily in the gift market with gift sets.

It was just about this time that Revlon made its initial bid for department store distribution with a style and fashion approach.

A few years later Chen-Yu entered the market. As the variety store began to grow, a substantial number of different brands competed for this dynamic part of the market.

Revlon's entry into the nail enamel business completely revolutionized this branch of the industry and, in turn, was probably a chief contributing cause to a decline in consumer interest for nail enamel.

Revlon's initial approach was new, revolutionary and aggressive. This company, starting with hardly any capital, with no previous retail experience and with two young brothers in charge, nevertheless entered the nail enamel business with certain unique advantages.

Due to a chain of very fortunate circumstances it was offered the first important change in the physical characteristic of nail enamel that had taken place since the first introduction of nail lacquer to the public. This innovation, offered by a private label company making lacquer, consisted largely of placing titanium oxide in clear lacquer, in this way giving an opaque velvety appearance to the lacquer which made, in fact, a new and completely different product.

At the same time a visionary, creative advertising agency man persuaded the company to enter into this highly competitive market, not with just the sale of lacquer but with a new and interrupting idea at this particular time—to sell color.

As Revlon entered the retail market, a number of forces were operating to make a new competitor and a change in status very welcome to a major part of the retail trade. Certain deep antagonisms existed in the mind of the retail trade and certain basic dissatisfactions with the policy of a predominant supplier. Throughout the retail trade there was an eager expectation for somebody vigorous, with a new idea that could be picked up, accepted and promoted as a foil to this other company. Revlon stepped into this fortunate retail situation at the precise psychological moment with a new product and a new sales idea. The result is history in this industry.

During the next eight or 10 years, as the products of Northam Warren gradually lost their former position in the leading and prestige stores and as the other smaller companies encountered difficulties in various degrees, Revlon became more and more aggressive and more and more competitive. This was not entirely on the basis of expanding the market for nail enamel, but also, it must be said, a competitive urge to submerge every other brand of nail enamel in the fashion field.

The number of nail enamel color promotions or fashion promotions which took place during the next several succeeding years was so great, so frequent and so aggressive that they more or less overwhelmed the capacity of the retailer and the consumer to absorb, accept or even remember them.

It is highly possible that this deluge of color and fashion promotions had a seriously negative effect on the consumer acceptance of nail enamel.

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when you need it!

When your aching head is a result of product packaging, Metro will diagnose accurately and prescribe satisfactorily. Whether your product be aspirin or rubbing alcohol, shampoo or cream, Metro will come up with glass containers that fill your needs down to the most exacting specifications. Experience, research, vast production facilities, and the absence of red tape tell the Metro story. When the personal touch plus trigger-timing make the difference, count on ***metromatic,*** the first class service for first class products!

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Aerosol lotions put something new under the sun—a no-muss way to a no-burn tan. And many similar products . . . including hand lotions, hair cosmetics, colognes, shampoos and depilatories . . . gain instant sales appeal by taking advantage of aerosol packaging with modern propellents like ISOTRON.

Have you investigated your product's aerosol opportunities? Pennsalt's ISOTRON Laboratory helps you with *personalized* aid in adapting your formulation, choosing the correct container, valve and propellent, and testing performance. And expert contract fillers, like those listed here, offer valuable services that simplify production.

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Arlington, Tenn.
Aerosol Industries
Div. of Zenith Drug Inc.
Newark, N. J.
Allied Professional Associates, Ltd.
Buffalo, N. Y.
A-M-R Chemical Company, Inc.
Brooklyn, N. Y.; Los Angeles, Calif.
Arlenge Laboratories
New York, N. Y.
Armstrong Laboratories
Boston, N.Y.C., Phila.
Associated Brands, Inc.
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G. Barr & Co.
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Chase Products Co.
Broadview, Ill.
Claire Mfg. Co.
Ft. Lauderdale, Fla.
Continental Filling Corporation
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Eveready Pressurized Products
Cleveland, Ohio
Fluid Chemical Company, Inc.
Newark, N. J.
Gard Industries, Inc.
Northfield, Ill.
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Paterson, N. J.
La Maur, Inc.
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Larson Laboratories Inc.
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Marcy Laboratories Inc.
Chicago, Ill.
Midwest Consultants, Inc.
St. Louis, Mo.
National Chemical Laboratories, Inc.
West Palm Beach, Fla.
National Spray Can Filling Corp.
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Orb Industries
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Southeastern Packaging Co.
St. Petersburg, Fla.
John C. Stalfort & Sons
Baltimore, Md.
Strouse, Inc.
Norristown, Pa.
Thomasson of Pa. Inc.
Norristown, Pa.
Wellston Aerosol Mfg. Co.
Wellston, Ohio

However, whatever may have been the cause for a decreasing consumer interest and from the practically monopolistic position of the one company in fashion distribution, the fact is that nail enamel today, as an important part of our industry and percentage wise in sales, has seriously lost ground compared to 20 years ago.

No longer do we see the brands of Lady Lillian, Barbara Bates, Chen-Yu, La Cross or many others.

To a big extent, what there is left of this part of the industry is now clustered in the variety store where such companies as Dura-Gloss, Cutex, Helen Neushaefer, Cameo, Hazel Bishop and a few others compete vigorously.

It may be that a new day is dawning for nail enamel. At any rate a vigorous, imaginative new presentation is now appearing on the market. Called Fresh Paint "the newest, liveliest, freshest way to illuminate your fingertips," it will soon be put on the market by Charles of the Ritz.

We understand that the formula of Charles of the Ritz really is new. It has a new degree of luster and durability and needs neither a base coat or top coat. The luster is brillant and pure.

An extremely interesting packaging presentation will accompany this new product. In this package the nail enamel comes in three small bottles so that while one is being used, the other bottles are waiting, still sealed and still completely fresh.

We think it will be highly interesting to watch this new product and this new venture of Charles of the Ritz. If it succeeds, as we hope and expect it will, it may mark the turning point when nail enamel will again assume an important status in makeup.

It looks as if the refillable aerosol will be the big thing this year for colognes. One is already on the market and at least three more packages are now in the works for middle spring introduction. We think that by Christmastime just about everybody in the cologne business will have a refillable aerosol package.

The very interesting thing about this refill is that it gives the cologne manufacturer the added element he has very badly needed, namely, the ability to spend enough money on the package to secure the elegance needed for this type of product.

One of the fears of the entire perfume industry in using aerosols has been that they would not be able to spend enough money for the package to distinguish and sharply differentiate the cologne aerosol from the mass of household and insecticide aerosols.

Up to now the cologne people have done a magnificent job of aerosol packaging within the amount of money allowable for a package. Now, with the new refill, they can really step out and develop some distinctive, beautiful and elegant packaging for aerosols that will invite from consumers no comparison with aerosol staple household products.

Pharmaceutical manufacturers have a right to advertise "in an interesting way." This was the theme of Robert Hardt, now president of Armour Pharmaceutical Co., in a speech before the central region of the Pharmaceutical Manufacturers Association.

"Pharmaceutical advertisers are entitled to tell their stories in an interesting way," he said, "and in so doing they must first attract attention to the story they have to tell.

"This is a highly competitive industry and in all such industries one must be aggressive if one is to survive. Moreover, all advertising people are aware that the secret of success is repetition, continuity and impact. And I might add that this is no longer a secret except to the uninitiated or to those who have given the subject little or no thought."

We would like to emphasize in italics, Bob Hardt's definition: *repetition, continuity and impact.*

A recent panel of the Sales Executives Club came up with some very interesting statements on marketing.

Here was one question. "How do you slice up your time in regard to advertising and the total marketing picture?" The answer: "In looking at a consumer product, it's important to emphasize that you cannot take anything away from the value and potentiality of the sales person. You need more and better salesmen all the time."

Here is another question. "What are the essential steps in selling your product?" The answer: "Find the proper outlets; seek to put your product in the right place, right shelf location; have the right number of packages on the shelf; get a price on the goods; seek to get a special display; seek to get the cooperation and better understanding of the retail market; seek to get the product featured in the retailer's advertising; get more of the same product on the shelf."

Here's another question. "How do you look on advertising in your job as president?" The answer: "In our business, the consumer is weaned. I don't think that advertising is any more important than field selling. If you haven't got distribution properly displayed, it doesn't make any difference how good your advertising is."

These statements are certainly very much in trend with the marketing thinking of today. Advertising is too wastefully extravagant to use unless the maximum effect is being obtained from personal selling and from every form of retail cooperation in the store and at the point of sale.

If working wives and mothers employed in America today were suddenly to drop their labor, it would be a national disaster of incredible magnitude.

This is a conclusion of the massive study, "Work in the Lives of Married Women," by the National Manpower Council on a grant from the Ford Foundation, since three out of every five of the 22 million women in the U.S.A.'s work force are married.

NOW! AEROSOLS SPRAY PAIN AWAY

Pharmaceutical aerosols may see next big market break-through!

Right now, pharmaceuticals are the fastest growing of all aerosol product groups. Pressure-packed drugs showed a sales increase of 155% in 1957 over 1956—compared to a 22% increase for all aerosols. A major market break-through seems imminent—for products such as spray-on burn remedies which are now being marketed, and for a host of other pharmaceutical products which have yet to be put up in aerosol form.

Right now's the time to plan on capturing *your* share of this market. And while you're considering aerosol packaging for your medicinal product—*or any other product* that can be sprayed, poured, brushed, dusted or daubed—General Chemical can be of real help to you in many different ways.

Help in making and marketing

As a leading producer of aerosol propellants, General Chemical offers many helpful services to present and prospective aerosol marketers.

Advanced research in our aerosol laboratories has led to the development of typical formulations for a number of new aerosol product ideas. For example, *Product Information Bulletins* are available now on such new aerosol pharmaceuticals as Athlete's Foot Medication, Burn Remedy, External Analgesic, Nasal Relief Spray, Neomycin Spray and Foam, Poison Ivy, Oak and Sumac Remedy, and Medicated Hand Lotion. Write for free copies of any or all, and ask to be put on our mailing list for new *Bulletins* as they are developed.

We will also be glad to put you in touch with highly capable contract fillers, who can put up small runs for you or handle full-scale commercial production. They will work with you from planning and testing through to volume filling. You don't have to invest a cent in equipment or production personnel when you work with these contract fillers!

General Chemical services include:

New Product Ideas

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For further information—or if you would like to arrange for a special presentation—write today to "Genetron" Dept., General Chemical Division, Allied Chemical Corporation.

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News in Packaging . . .

Precision Valve Offers Licensing Agreement

The Colgate-Palmolive Company has entered into a licensing agreement with Precision Valve Corporation of Yonkers, N. Y., permitting Colgate to package under Precision's pending patent application a pressure-dispensed toothpaste in an aerosol container.

Precision is offering similar royalty-free licensing agreements to all companies currently marketing aerosol dentifrices, to facilitate widespread merchandising of the product.

Economy Size for Sucaryl

Abbott Laboratories has introduced a new economy-sized pint bottle for noncaloric Sucaryl, sweetening solution. The bottle is oval and tapers from top to bottom, giving excellent light reflection to the clear product and insuring a steady base. A ribbed closure of white plastic seals the bottle, which also has a plastic dispensing unit. Bottle, closure and dispensing unit are supplied by the Owens-Illinois Glass Company, the labels by A. M. Steigerwald Company.

Perfumed Nail Topcoat

Tyrex Drug & Chemical Company has come up with a perfumed topcoat to be applied over any nail lacquer, or directly to the nails. Called DuraScent, it comes in three fragrances, which are said to last an entire day, withstand washings, prevent peeling of nail enamel and impart a luster to the nails.

Plastic Lids Get Firm Grip

To prevent the plastic cover used by Helene Curtis for packages of toiletries from slipping off and allowing contents to tumble out, Plastofilm, Inc., devised a lid with a firm grip. An 0.015-inch gauge transparent acetate sheet by Campco, Division of Chicago Molded Products Corporation, was given a special twist. The four running edges of the slip-in lid are ribbed, which adds to the strength and rigidity of the lid, and each of the four corners is pronged to bite into the inside of the cardboard of the lower portion of the package. When the lid is pressed into place the carton will not spill its contents, even if completely inverted.

Fain Bubble Bath Packed In Nondrip Metal Cans

Fain liquid bubble bath, a new product in a new package, is now being marketed by Martin Manufacturing Company. The nondrip metal can container, manufactured by the American Can Company, is lithographed in pink, white and iridescent blue and gold, presenting the Fain logotype on one side, directions for use on the other. Soap is said to be unnecessary with Fain.

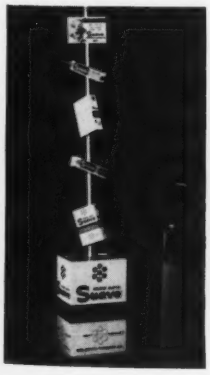
Glue-Sealed Cartons Favored by Retailers

The Consumer Package Research Division of Alford Cartons has published the results of a survey of 100 supermarket managers which shows an 83 per cent preference for glue-sealed folding cartons over taped or tucked cartons. Glued cartons were preferred because they stay closed, they are easiest to stock, they allow for less pilferage and they have the longest shelf life, according to the managers interviewed.

Kenalog-S Lotion, new anti-inflammatory and anti-bacterial dermatologic preparation from E. R. Squibb & Sons, in an 0.1 per cent solution, is supplied in economical 7.5 cc. polystyrene squeeze bottles by T. C. Wheaton Co.

The Mennen Company's new deodorant stick for teen-age girls, called "date-line," is a clear, nonalcoholic stick that twists up out of its plastic case like a lipstick, and comes in four pastels, pink, blue, green and yellow.

Four winners of bronze ribbons in the 1959 Fibre Box Competition sponsored by the Fibre Box Association of Washington, D.C.: (left to right) corrugated floor stand for Helene Curtis' Suave, a hair preparation, by Gibraltar Corrugated Paper Company for creative display; corrugated floor stand for Revlon's hand lotion Silicare, by Interstate Container Corporation, for surface design; stand for Shulton's stick deodorant and after shave lotion by United Container Company; and a corrugated display-shipper for Warner-Lambert Pharmaceutical Company's Listerine toothpaste, by Gibraltar Corrugated Paper Company. Gold, silver and bronze awards were given in 12 categories.



Colonial

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Stress *Q.F.

THE Quality Factor, "Q.F.", in Colonial droppers and assemblies plays a key role in giving mothers peace of mind. Colonial's painstaking attention to quality standards has produced a product which continually meets modern hygienic demands required for new arrivals.

Let our technicians make free samples to your exact specifications. We have a Special Services Department to provide precision calibration in silk screening and hot stamping, too. It will pay you to contact a Colonial representative listed below or write to us directly.

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New York 17, N. Y.	Chicago 4, Ill.	Philadelphia, Pa.	Los Angeles 48, Cal.	Toronto 3, Canada
OXford 7-0760	WAbash 2-1619	GRanite 6-6311	BRadshaw 2-2995	LEnox 2-3311

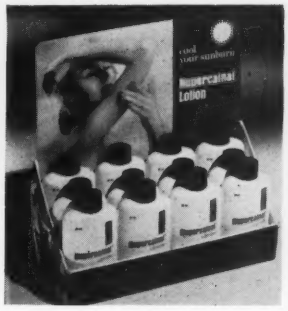
COLONIAL APPLICATOR CO.

VINELAND, NEW JERSEY

WINNERS OF THE 1959 FOLDING CARTON COMPETITION in the fields of medicinal and cosmetic packaging, sponsored by the Folding Paper Box Association of America, from left to right: for Novahistine by Pitman-Moore Company, Division of Allied Laboratories, Inc., merit award for general merchandising superiority and best display—effective two-color printing, continuity of graphic design on individual and display containers; boxmaker, Paper Package Company; designer, Jordan-Sieber & Corbett, Inc. For Red Cross Cotton Balls by Johnson & Johnson, first award for general merchandising superiority—switch from medicinal package to one with feminine appeal; boxmaker, The Richardson Taylor-Globe Corporation.

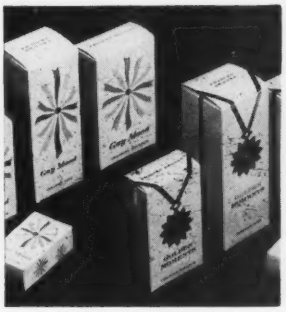
For Deca-Vi-Sol, Tri-Vi-Sol and Poly-Vi-Sol Tablets by Mead Johnson & Company, merit award for general merchandising superiority—in four colors with throwaway protection sleeve, straight tuck cartons are effective and economical and provide adequate space for copy, each having six cutouts in the front panel to hold product securely; boxmaker, Paper Package Company; designer, Coventry Miller & Olzac, Inc., in cooperation with the customer's art director Charles Gneagy. For Unicap 250's by The Upjohn Company, merit award for general merchandising superiority—four-color reproduction of apothecary jar gives merchandising impact to a neat, ethical, medicinal package; boxmaker, Continental Can Company.

For Unicap and Zymacap by The Upjohn Company, merit award for general merchandising superiority—best display, which includes seven pieces bearing certain similarities in construction and design that achieve uniformity of effectiveness, but maintaining differences for the identification of individual products of the product family; boxmaker, Ace Carton Company; designer, The Upjohn Company. For Nupercainal by Ciba Pharmaceutical Products Company, merit award for general merchandising superiority—excellence of graphic design, fine process color printing and sturdy construction, an outstanding point-of-sale display in four colors; boxmaker, The Nevins Company.



In the field of cosmetic packaging: for Touch & Glow make-up by Revlon, Incorporated, first award for superiority of printing, two-color letterpress—pink plus a subtle gold bronze show excellent adaptation of graphic elements, precise color register and cleanliness of printing; boxmaker, The Lord Baltimore Press, Inc.; designer, Bertram Reibel of Revlon. For Avon Men's Line by Avon Products, Inc., first award, technical superiority of printing, multi-color letterpress, and first award, general merchandising superiority—ingenuity in family identity and skillful printing, crispness and freshness of appearance; boxmaker The Lord Baltimore Press, Inc.; designer, Maxwell B. Rogers of Avon.

For Golden Autumn Cologne by Prince Matchabelli, Inc., first award, technical superiority of printing, color process letterpress—quality of the plates and paper and cleanliness and fine register of a colorful spray of fall leaves in red, yellow, black and gold; boxmaker, The Warner Brothers Company. For Golden Moments and Gay Mood by Denney and Denney, Inc., merit award for superiority of printing, lithography—adaptation to fine materials with a rich result through Lowe's 90-pound board and gold leaf stamping maintaining the traditional quality appearance of the package at substantially lower cost than was formerly possible with the set-up box; boxmaker, F. N. Burt Company.



For Spring Fancy, a line of colognes by Prince Matchabelli, Inc., merit award, general merchandising superiority—elegant simplicity, delicate lace borders and colorful approach achieving a spring mood, printed in four colors; boxmaker, The Warner Brothers Company. For Prell liquid shampoo by Procter & Gamble Company, merit award, general merchandising superiority—an effective package innovation, the showcase effect without use of a film window, showing the plastic tube clearly and illuminating it by the use of foil inside, which adds luster to an already outstanding carton; boxmaker, The Richardson Taylor-Globe Corporation; designer, both Procter & Gamble and Richardson.

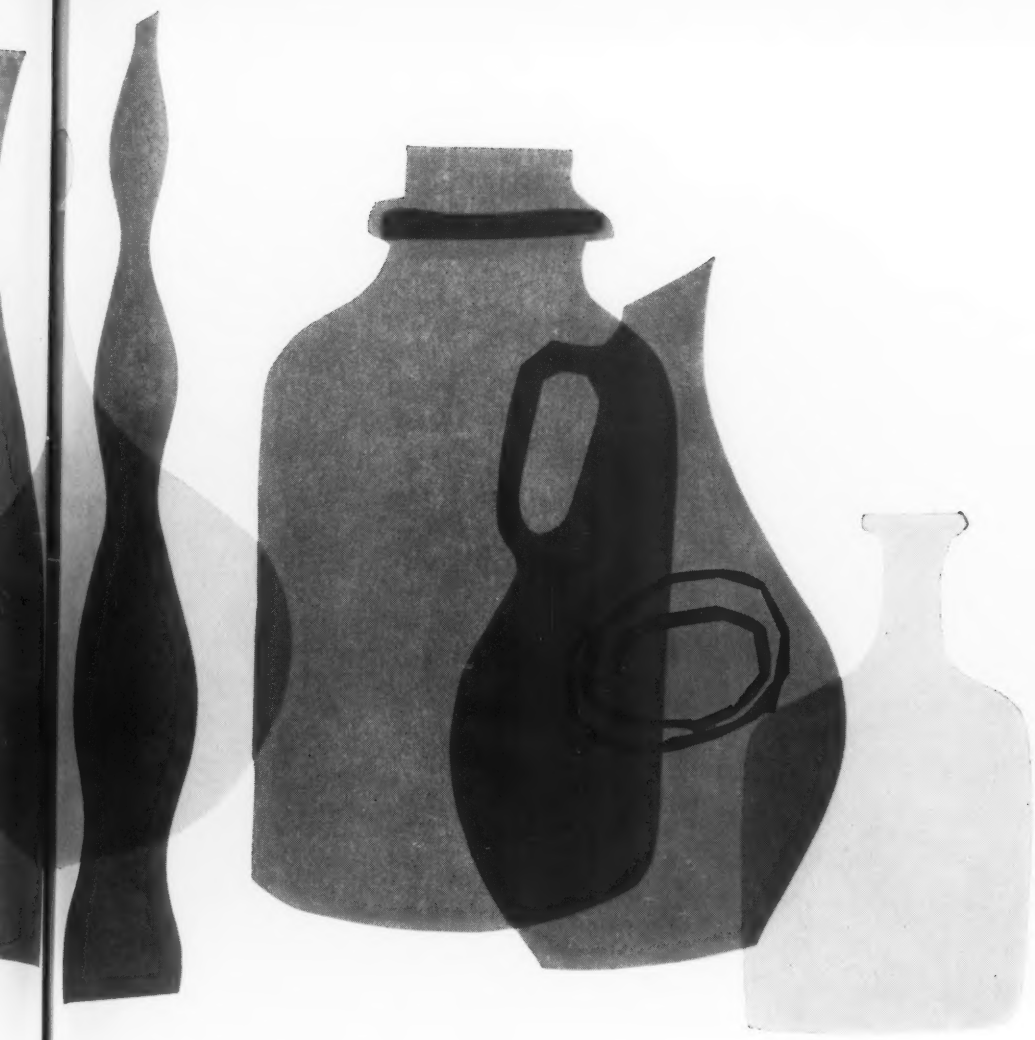
Advance Styling

...offers more product

H-A's new service adds exciting impact to your package, for greater sales appeal on retail display. We employ advanced styling and design to help you satisfy your customers—to meet their proven demand for new and better products, packaged most conveniently—a practical service, imaginatively conceived . . . and dedicated to your future planning and immediate market.

So think for just a moment—*What do you make that can be improved upon now, that can be better shaped for the future! What would you like to make—and how will you sell it, without advanced styling and design!*

Write Wheeling, or ask your H-A representative how this practical, new service can be put to work for your products today!



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division of

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Wheeling, West Virginia

NEWS and VIEWS

BY TED KLEIN, PUBLIC RELATIONS DIRECTOR*

Anatomy of New Product Failures

A recent piece on "Why So Many New Products Perish" in *Advertising Age* by James Woofe, longtime creative consultant in consumer advertising, has stimulated me to think about the problems inherent in introducing new pharmaceutical products. Woofe cites government figures showing that 98 per cent of all new consumer products perish at the marketplace. Is there any reason to assume that new pharmaceutical products do any better? We think not.

How can you avoid new product failures? I will try to answer this question from the combined experience of the experts at the advertising agency where I work.

We have developed a check list which we routinely use when we get an assignment to plan the advertising for a new drug. In the initial phases of our work we usually try to see that our total marketing concept checks with the following observations and questions.

Check List Before New Product Is Introduced

(1) Has the product been developed to meet a real existing need? Or will the advertising and promotion have to create that need?

(2) Is it being marketed on the basis of someone else's apparent success with a similar product?

(3) Will it have the enthusiastic support of the sales force?

(4) Has there been market research adequate to define the characteristics of the potential product users?

(5) Has the selection of advertising media been made on the basis of matching the media to the market?

(6) Does our projected media coverage match the product's distribution pattern?

(7) Will the new product fit in with the market's image of the company planning to market it?

(8) Is this the best time to introduce the product?

(9) Is there enough money available to carry out not only the initial promotion, but also a long-range program?

(10) Is there a clear-cut clinical background for the product, or will it depend upon empirical use?

After a product is on the market, we try to monitor its sales to check our efforts. Oftentimes promotional direction must be changed to meet the response of the market, once physicians have been exposed to the product and its advertising. We have found that planned checkpoints must be established in order to measure the new product's impact on the market.

Check List After Product Is Introduced

(1) Is there still sales enthusiasm?

(2) Has the sales progress of the product been carefully monitored?

(3) Do we know just how much has been spent to sell the product; for advertising; for detailing?

(4) Is the product being used for the indications listed in the advertising?

(5) Are there any new indications which we were not aware of when we introduced the product?

(6) Is distribution adequate?

(7) Is the sales and advertising message actually reaching the market?

We believe that if these evaluations are made there can be a far better understanding of why products fail and why they succeed. Of course, many times the manufacturer has to enter the market with a product without adequate market research. But often sufficient time is available to build into a program those checks that will provide a reasonable insurance against surprise marketing setbacks.

Hearst on Advertising

William Randolph Hearst once wrote his definition of advertising. I think it applies now as well as it did many years ago.

"Advertising is your means of public approach. If you make a product good enough even though you live in the depths of the forest, the public will make a path to your door, says the philosopher. But if you want the public in sufficient numbers, you would better construct a highway. Advertising is that highway."

Bomb Expert

A recent example of informed public relations tells how Ortho Pharmaceutical has devoted many years of effort and expense towards helping the Government of India find ways to solve its problem of increasing population. The article called attention to the fact that as of now, due to import restrictions, Ortho sells very little of its product in India. And yet Ortho's management feels that the goodwill generated by this sort of help will eventually pay off when they have an effective and very inexpensive drug.

A serious student of the problems posed by the "population bomb" is Ortho's newly appointed advertising manager, John Baruch. It is interesting that Ortho selected an expert public relations man to fill the long vacant post of ad manager.

Prior to his new appointment, John was manager of public relations for Warner-Lambert. Before that he had been a detailman for five years at Ortho. Born in Germany 32 years ago, he received his primary education in Berlin. After high school in England, he went to Harvard to take his A.B., graduating *cum laude* in 1950.

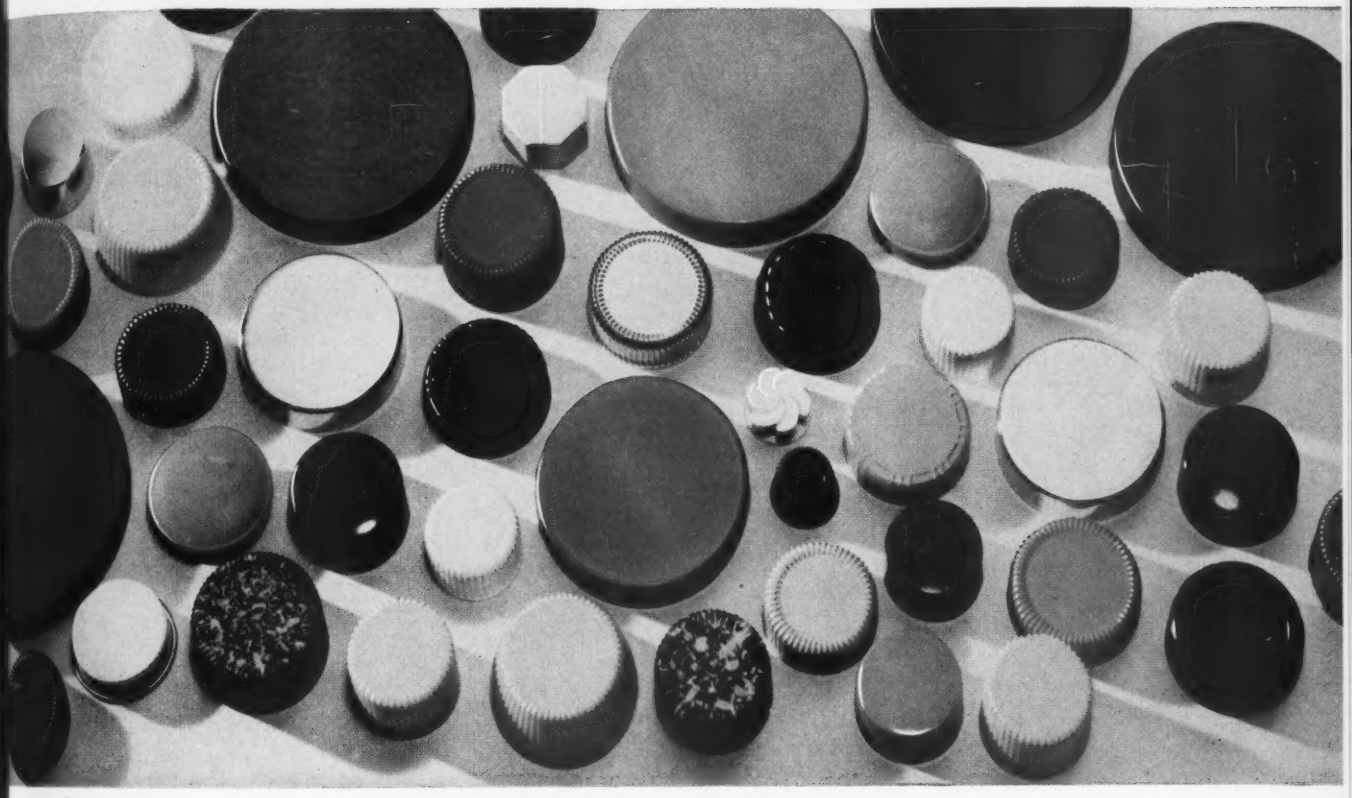
Quite naturally, in a job where controversy runs rampant, John has to believe in his company and the products it sells. Recently when talking about this he said, "I feel proud to have the opportunity at Ortho to have a share in making available to the medical profession some of the means to control the world's 'exploding population' in an effort to provide a better life for each *wanted* child to enjoy."

John A. Baruch, newly appointed advertising manager for Ortho Pharmaceutical Company.

*Paul Klemtner & Company, Inc.

Colorful "special effects"...

or golden metalized...



Owens-Illinois Closures add to the sales appeal of your package

Lovely closures such as these help to make your salespackage a standout on shelf or counter... express its quality and compel sales action.

Owens-Illinois closures add beauty, but of equal importance is their durability and resistance to most chemicals... providing the ideal closure for almost any product.

Plastic and metal closures are but one part of the Owens-Illinois Complete Packaging Approach ... the right container, attractive label design, special fitments, and merchandising carton.

Ask your Owens-Illinois representative for complete details on closures or any part of the packaging service.

METAL AND PLASTIC CLOSURES
AN (O) PRODUCT

OWENS-ILLINOIS
GENERAL OFFICES · TOLEDO 1, OHIO

YOUR PRODUCT DESERVES A PEERLESS CONTAINER

Collapsible metal tube or aluminum aerosol—if it's made by PEERLESS, it has a half-century of inventiveness, resourcefulness and technical know-how behind it. Let's look at the record!

- The introduction of bakelite caps for metal tubes.
- A vastly improved machine for the internal waxing of lead tubes. Redesigned and patented, this unique machine continues to solve compatibility problems all over the world.
- The application of internal lacquers.
- The first mastitis tube. This development made possible the administration of antibiotics to afflicted cattle and has saved the dairy industry about one half-billion dollars each year.
- A machine for applying and fastening plastic necks to collapsible metal tubes (patented 1947).
- The introduction (1949) and development of polyethylene closures for collapsible tubes.

These PEERLESS firsts have helped the collapsible metal tube to attain its present position as the package without equal for firm-consistency products. Modern, dependable and convenient, it preserves its contents over a long shelf life.

And when it comes to Aerosols...

PEERLESS, with its 50 years of impact extrusion experience, has pioneered in extruded aerosol containers made of aluminum — the preferred metal for your drug or cosmetic products.

Aluminum Aerosols by *PEERLESS* have these important advantages

FOR YOUR CUSTOMER 1. Combined durability with beauty. 2. Contents cannot spill, leak or evaporate. 3. Best method of dispensing many products. 4. Sizes ideal for travel, the purse, the vanity table and the medicine cabinet.

FOR YOU 1. Preciseness of valve-cup fit greatly improved by patented* process. 2. Container is sturdy and seamless to withstand all required pressures. 3. Tested by more than three years of manufacture and use. 4. Available in a choice of diameters and lengths for each size—½-ounce to 4-ounce.

NO FINER METAL CONTAINERS MADE ANYWHERE **PEERLESS** *TUBE COMPANY*

BLOOMFIELD, NEW JERSEY

*U. S. PATENT NO. 2,856,102—OCTOBER 14, 1958

With Bernardin • Quality is a **SERIES** of satisfactions

THE PRINTING PROCESS

Pictured here, a Bernardin foreman makes the final of a series of critical inspections that provide for the appearance and uniform attractiveness of each Bernardin closure.

At this, the final of several metal coating inspections, skilled workmanship is reflected in sharp, clean-cut definitions of design and lettering, with true, lustrous colors so appealing to the eye.

In this way Bernardin through positive controls at each of the many manufacturing steps between sheet steel or basic plastics and the final, handsome closure; insures the validity of "With Bernardin—Quality is a *Series* of Satisfactions."

QUALITY METAL AND PLASTIC CLOSURES BY

BERNARDIN
Bernardin Bottle Cap Co., Evansville, Ind.

Patent thoughts and trends

BY THOMAS CIFELLI, JR., PATENT ATTORNEY*

A Good Way to Save Money on Patents

Old soldiers are not alone in never dying. In the patent field it seems almost impossible to kill the old chestnut that the smart thing to do in a patent application is to tell little and claim a lot. Regardless of whether this idea ever had any validity in the United States of America, the fact is that it certainly is now incorrect; and those who follow this tenet usually live to regret it. Nevertheless, it is believed that the idea still is widely held, and the writer will make another attempt to try to dispel it.

Those who turn over an inadequate amount of information to their patent attorneys are inviting two consequences. First, if a patent attorney writes up a draft of a patent application on the basis of the information given, the chances are very good that if any protection is obtained it will be extremely narrow, inviting competitors to circumvent the patent protection without much difficulty. Secondly, if the patent attorney insists on obtaining sufficient information to protect the invention, he will have to devote so much time and effort to this "digging operation" that he will necessarily have to charge a higher fee than would otherwise be the case.

There are other things that often happen to make one rue the day that a decision was made to try and get by without enough data. However, the two mentioned should put across the point sufficiently.

While the intent here is not to go into any extensive discussion of the situation, it is felt that a brief discussion of the underlying problem and some suggestions for meeting it may prove helpful.

First, of course, we are only concerned with what we might call inventions in the chemical field. The mechanical and electrical fields do not present the problem with which we are presently concerned, as a general matter.

The two main parts of the patent application are the specification and claims. Patent Office Rule 71 (a) and (b) and 75 (d) set forth the main requirements for these parts of the application. For this reason these particular provisions are set out in full.

"71 (a) The specification must include a written description of the invention or discovery and of the manner and process of making and using the same, and is required to be in such full, clear, concise, and exact terms as to enable any person skilled in the art or science to which the invention or discovery appertains, or with which it is most nearly connected, to make and use the same.

"71 (b) The specification must set forth the precise invention for which a patent is solicited, in such manner as to distinguish it from other inventions and from what is old. It must describe completely a specific embodiment of the process, machine, manufacture, composition of matter or improvement invented, and must explain the mode of operation or principle whenever applicable. The best mode contemplated by the inventor of carrying out his invention must be set forth.

"75 (d) The claim or claims must conform to the invention as set forth in the remainder of the specification and the terms and phrases used in the claims must find clear support or antecedent basis in the description so that the meaning of the terms in the claims may be ascertainable by reference to the description."

Since the requirements are few and clear and since it costs money or endangers protection not to meet the requirements, it only makes good common sense to comply. For this reason it is felt that before a disclosure of an invention is turned over to a patent attorney the inventor in the chemical field should have done what he reasonably can do in order to help secure adequate protection. This is not to suggest that the patent attorney will not have questions and suggestions of his own. However, as we have already seen, putting the entire burden on the patent attorney is liable to be damaging to the protection obtained or to the pocketbook. Obviously, these considerations do not apply where the patent attorneys and inventors are both employed by the same company, as it really doesn't make much difference which branch, broadly speaking, of a company supplies the data.

Some time ago the writer considered the best advice that could be given to chemists on this point. In summary form the suggestions were contained in Chapt. 53 of "Cosmetics Science and Technology," 1957, Interscience Publishers, Inc. The suggestions as there stated were as follows.

"It is in the interests of the inventor to determine what the scope of his invention is before a patent attorney or agent is consulted. This will save time and money and will contribute to obtaining maximum patent protection. This determination should preferably be based on experimental evidence, but at the very least should be arrived at on theoretical considerations. Questions to be considered will naturally depend on the nature of the invention; for example, whether it involves a process or a composition of matter. Since in practice many patents are granted with both process and product claims, it is desirable to consider all factors, leaving it to the attorney or agent to determine what information is required for the particular case. It is therefore recommended that a potential applicant have the following information before he consults his patent adviser:

(1) "A statement concerning the problem that has been solved and the advantages of the invention.

"Is the process less costly than prior ones? Quicker? Does it give better yields? Has a new use for an old material been found? Has a more effective product been made? Is the product more stable? Less toxic?

(2) "The publicly known methods of accomplishing the same or related

*Richards and Cifelli, Newark, New Jersey.

POLAK'S FRUTAL WORKS INC., MIDDLETOWN, N.Y.

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objectives. This is what is termed 'prior art.'

"Prior art includes everything disclosed in any patent or described in any printed publication anywhere, and anything already known or used in the United States of America. Nevertheless, information known by others in this country cannot be used to defeat a patent applicant if such information has been abandoned, concealed, or suppressed. Trade secrets are not considered part of the prior art, but processes practiced without special secrecy provisions are considered in the domain of public knowledge. An inventor's own patents can be used as prior art against a later patent application only where the patent issued before the later application was filed.

(3) "Why the potential applicant believes it was not obvious for one in possession of knowledge of the prior art to solve the problem.

"Here, even though the potential applicant may not in fact have been aware of the prior art at the time he solved the problem, he is chargeable with such knowledge and his solution to the problem must involve invention over the prior art, whether or not such knowledge was actually known to the inventor at the time the invention was made.

(4) "A complete statement of the process, and, if a novel composition or product is also involved, the formula or recipe and physical and chemical properties of the composition or product should also be given.

"In either case, the substitute materials should be included. Thus, for example, if a process involves the use of methyl alcohol and other alcohols may also be used, this should be stated. Indeed, by exploring other possible substitute materials and conditions, the basis is laid for broad claims. Such claims may make it possible to 'fence in' the invention so well that competitors may be hard put to find feasible ways of circumventing the patent. Failure to investigate alternative materials and conditions may result in such narrow patent protection that competitors can easily employ the inventive principle without risk of infringement.

"Care should be exercised, however, in avoiding unfounded or unduly broad assertions as claims based thereon may be invalid. In such cases the narrower claims may still be valid as a theoretical matter, but the unfavorable psychological effects on a judge faced with unduly broad claims cannot be overestimated."

Some elaboration of point 4 above may be of possible help. With respect to what is meant by a complete statement of the process, the following items should be covered:

(1) A listing of all of the essential materials used in the process as well as specific substituents for those materials and a general statement covering all of the operable materials and excluding all of the inoperable materials;

(2) The same for optional materials employed in the process;

(3) Permissive and preferred ranges with respect to the proportions of all of the ingredients employed;

(4) Permissive and preferred reaction conditions such as temperature, pressure and time;

(5) Methods of control; and

(6) Sufficient specific examples to support the claims.

With respect to novel compositions the following items should be covered:

(1) Components, stated generically and specifically;

(2) Concentrations: permissive and preferred ranges;

(3) Methods of preparing the composition;

(4) Properties of the composition; and

(5) Uses of the composition.

With respect to novel chemicals, the following should be covered:

(1) Methods of preparation;

(2) Physical properties;

(3) Chemical properties; and

(4) Uses.

It may be advisable again to note that the intention here has not been to give a complete treatment of the problems but rather to touch the highlights so that the greatest practical benefit consistent with not overburdening the inventor is realized.

Antibacterial Compositions

The incorporation of antibacterials in various consumer and industrial products has been one of the phenomena of recent decades. Examples of products to which antibacterials have been added include soaps, textiles, paints and resins. Recently, U. S. patent 2,873,263 was issued on a method for incorporating certain antibacterials into resins. This patent has been singled out in order to highlight the versatility of antibacterials. It is felt that detailed study of this patent will be of general interest, since it shows how some specific problems were overcome.

While it was known that many phenols or thiophenols possess antibacterial properties, it was also well known that they act as inhibitors in the polymerization of monomers such as alkyl methacrylates, alkyl acrylates, styrene, substituted styrenes and vinyl esters. This disadvantage was overcome, however, by using metal salts of the phenols or thiophenols, free of phenol or thiophenol.

The following specific salts were disclosed in the patent as useful in the invention:

Zinc phenoxide
Aluminum p-methylphenoxide
Sodium methyl salicylate
Potassium p-chlorophenoxide
Zinc beta-naphthoxide
Borium 2,4,5-trichlorophenoxide
Sodium 2,3,4,5,6-pentachlorophenoxide
Zinc thiophenoxide
Sodium 2-chloro-6-phenylphenoxide
Zinc 2,4-dibromophenoxide
Aluminum p-methoxyphenoxide
Ethyl mercuri-thiosalicylic acid
Sodium ethyl mercuri-thiosalicylate
Zinc ethyl mercuri-thiosalicylate
Aluminum ethyl mercuri-thiosalicylate
Triphenyltin thiosalicylic acid

The practical use of the invention is stated by the inventor in the following language:

"Resins, in general, are not antiseptic. Bacteria and fungi can grow on and around the resinous material. In airplanes, particularly in tropical climates, fungi often grow on wind screens and reduce visibility. Plastic floor coverings in hospitals are not free from bacteria and fungi. This invention thus contributes greatly in these and many other fields where antibacterial resins are desirable. The use of antibiotics such as aureomycin, streptomycin, bacitracin, chloramphenicol, etc. has been suggested in dental cements and direct resin filling materials. The solubility and relatively unstable character of these antibiotics reduces their useful-

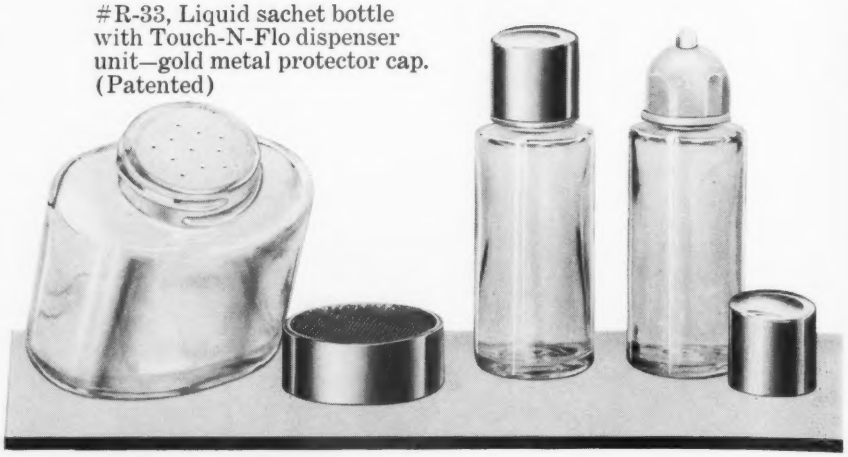
(*Continued on page 541*)

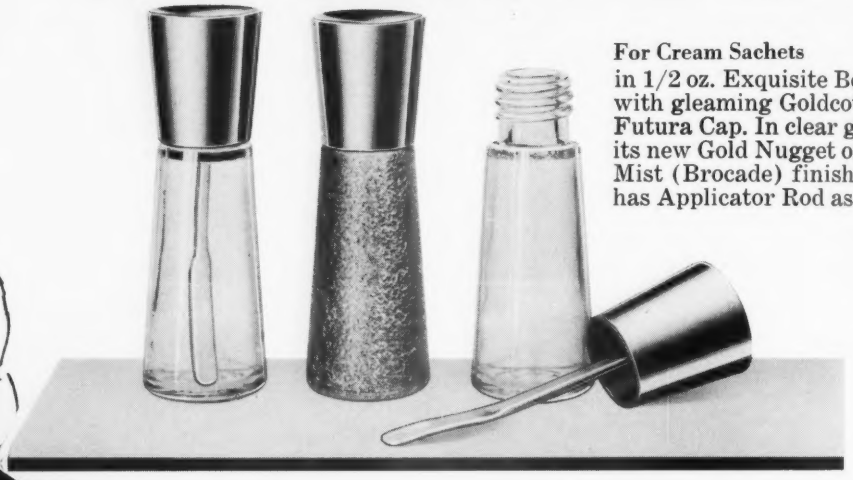
RICHFORD offers the new shape...

in Sachet Containers

A new flat oval 1½ oz, Jar, #1908—with or without Sifter Top and Goldcote Closure for sachet powder. And a companion 1/2 oz.,

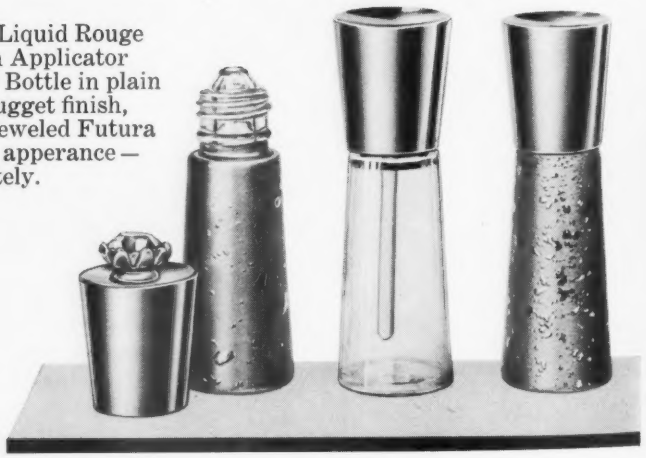
#R-33, Liquid sachet bottle with Touch-N-Flo dispenser unit—gold metal protector cap. (Patented)





For Cream Sachets
in 1/2 oz. Exquisite Bottle with gleaming Goldcote Futura Cap. In clear glass or its new Gold Nugget or Gold Mist (Brocade) finish. Cap has Applicator Rod as shown.

A new 2 dram Liquid Rouge Container with Applicator Rod. Exquisite Bottle in plain or new Gold Nugget finish, with plain or Jeweled Futura Cap. Deluxe in apperance—priced moderately.



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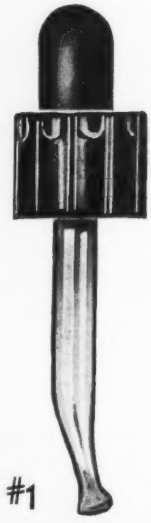
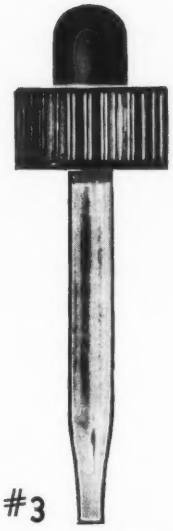
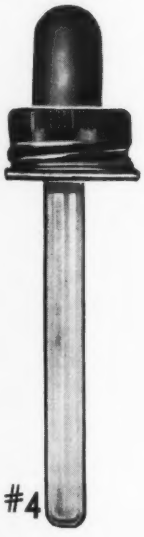




This Inexpensive EXTRA FEATURE Adds A Welcome Convenience To The Use of Your Product

Accurate calibration of New Perfection dropper glasses adds immeasurably to the user's satisfaction with your product. Not only is the specified dose measured with more precision, but the tedious and time-wasting practice of counting drops is made unnecessary.

Trade-marks or firm names may also be imprinted on the glass, assuring that the name will be identified with the product each time it is used.



We supply various colors of bulbs in natural rubber or in our special oil-resisting Amekine compound, caps of plastic or metal in many sizes and colors, and various types of dropper glasses in any length. New Perfection dropping parts will fit your own bottles, or can be supplied in combination with our Modernistic bottles in Amber, Blue, Green or Clear glass. Sizes: ⅛, ¼, ½, 1 and 2 oz. (Immediate shipment on all sizes and colors.)

We can give prompt service on your special requirements for large or small quantities of droppers made from glass or plastic and in special packaging such as cellophane-wrap.

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For ease of use — For dependable results — For solving difficult problems

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Glyceryl Monostearate — Acid Emulsifying. For anti-perspirant — deodorant creams, lotions and ointments — all greaseless, medicated formulations.

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Glyceryl Monostearate — Self Emulsifying. For neutral greaseless creams, lotions, ointments, suntan creams.

Tegin 515...

Glyceryl Monostearate — Non Self-Emulsifying. Used in conjunction with auxiliary emulsifiers.

Tegin P...

Propylene Glycol Monostearate — Self Emulsifying. For greaseless creams—brushless shave, foundation, suntan: lotions — foundation, suntan, ointments.

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gives better quality pines at lower cost. PINATONE, a pine reinforcer, is based upon a new exclusive synthetic aromatic developed by Rhodia's chemists. Only 10-15% PINATONE improves the lasting power, softens the end notes and rounds out the fragrance of even inexpensive pine and new mown hay compounds—giving a better quality at lower cost. For PINATONE samples and formulating service, contact your Rhodia representative today.

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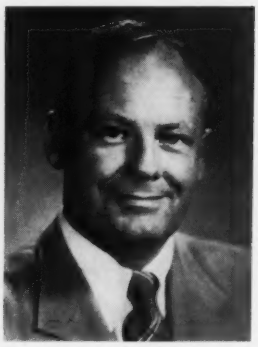


Left to right: George J. Abrams, president and chief executive officer of Cosmetics and Toiletries Division of Warner-Lambert Pharmaceutical Company; John J. McClellan, now vice-president of oral products, in addition to his position as general manager of oral prducts, Warner-Lambert's Family Products Division; Dr. John R. Beem, director of clinical research, Warner-Lambert Research Institute; and Jack N. Durben, who has been promoted to the position of manager of production and inventory planning, Miles Laboratories.

NEWS...

Appointments and Promotions

Clark H. Carter, vice-president of Vick Products Division of **Vick Chemical Company,** has become vice-president and assistant general manager of **Walker Laboratories, Inc.,** a Vick subsidiary. Arthur L. Boschen, formerly vice-president and comptroller for Vick, has become vice-president for finance, a newly created position, and J. Donald Powers has been named comptroller of the **Vick Products Division.**

George J. Abrams has been appointed president and chief executive officer of a newly formed **Cosmetics and Toiletries Division of Warner - Lambert Pharmaceutical Company.** Mr. Abrams had been advertising vice-president of Revlon, Inc. In the firm's **Family Products Division,** John J. McClellan has been appointed vice-president of oral products, in addition to his position as general manager of oral products. In its expansion of proprietary drugs, William P. Broas has been made director of sales and field marketing. Associated with Warner since 1951, Mr. Broas was formerly manager of field sales administration. The **Warner-Lambert Research Institute** has appointed Dr. John R. Beem as director of clinical research. He was formerly assistant director of clinical investigation for Merck Sharp & Dohme Research Laboratories.

The **Union Carbide Chemicals Division of Union Carbide Corporation** has made three appointments in the marketing organization: Robert L. Duncan, sales manager, is now director of product marketing; Robert C. Boltz, formerly product sales manager, is now sales manager in charge of sales forces; and Philip Magnusson, who has been assistant product manager, is now product sales manager for plasticizers, monomers and higher alcohols.

Arthur C. Gogarty, who has served as head of the Sales Division of **Tombarel Products Corporation** for more than eight years, has been elected president and treasurer of the company.

Francis A. Baldauski, formerly a development chemist for Nopco Chemical Company, has become technical sales representative in Metropolitan New York for **Sterwin Chemicals, Inc.**

The directors of **F. B. Redington Company** have voted the following changes: Charles L. Barr, formerly president, is now chairman of the board; E. A. Siebert, formerly executive vice-president, now vice-president; Wade Meloan, formerly vice-president of Pettibone Mulliken Corporation, is vice-president; Dorothy M. Ross is secretary and treasurer.

Irving Hornstein has been promoted from comptroller to the position of executive assistant to the general manager of **Park & Tilford, Tintex and Toiletries Division.**

George C. Farmer has joined the **Atlantic Division of National Can Corporation** as purchasing agent. He was formerly in a similar position with Diecraft, Inc.

Jack N. Durben, formerly production planner for **Miles Laboratories, Inc.,** has become manager of production and inventory planning.

Vito Victor Bellino, formerly a laboratory supervisor for the Barrett Division of Allied Chemical Corporation, has joined **Wyeth Laboratories** as manager of the patent liaison section.

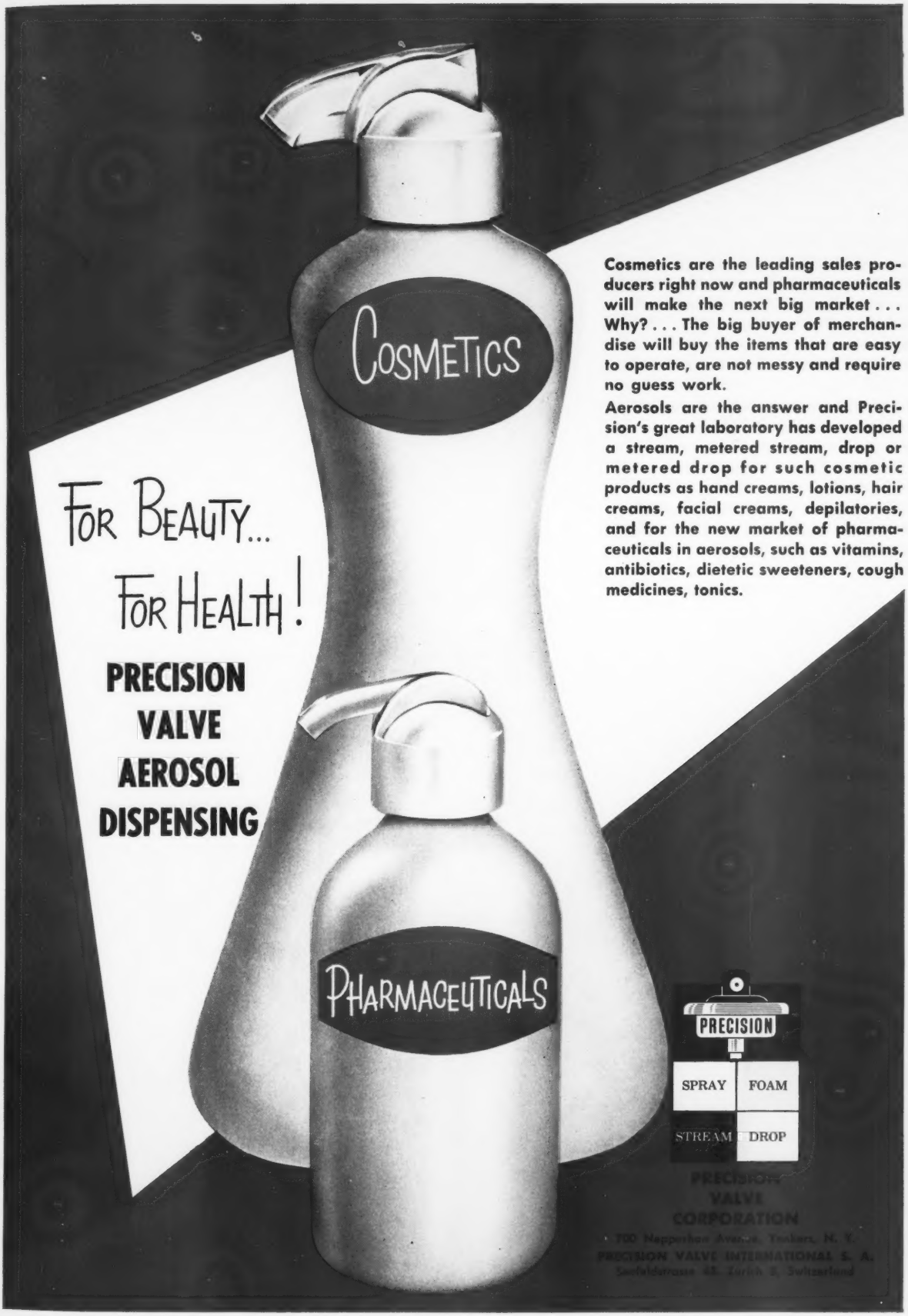
Dr. Gerhard Zbinden has been promoted from pathologist and toxicologist in the department of experimental medicine of **Hoffmann-La Roche, Inc.,** to the position of director of biological research. He will supervise the pharmacology, medical and chemotherapy departments. The company has also promoted S. Evert Svenson, M.D., from director of medical services to medical director. Dr. Svenson has been with the firm since 1952. Dr. John A. Aeschlimann has been promoted from a vice-president to vice-president in charge of research. He has been with the company since 1927.

Thomas J. March, formerly manager of materials and devices sales for the Specialty Electronics Components Department, has been appointed manager of sales for the Silicone Products Department of **General Electric Company.**

Robert W. Walance, formerly director of market research for **Max Factor & Company,** has been appointed product manager in the firm's United States merchandising division.

Eaton Laboratories has appointed John F. Bass as information scientist in the **Scientific Information Division.** Mr. Barr served as hospital services coordinator and district medical administrator for Arabian-American Oil Company in Saudi Arabia from 1952 until his new appointment.

Harry Fields has joined the sales staff of **Commercial Solvents Corporation** with responsibility for sales of industrial chemicals in Cleveland and Pittsburgh areas, replacing Rus-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Cosmetics are the leading sales producers right now and pharmaceuticals will make the next big market . . . Why? . . . The big buyer of merchandise will buy the items that are easy to operate, are not messy and require no guess work.
Aerosols are the answer and Precision's great laboratory has developed a stream, metered stream, drop or metered drop for such cosmetic products as hand creams, lotions, hair creams, facial creams, depilatories, and for the new market of pharmaceuticals in aerosols, such as vitamins, antibiotics, dietetic sweeteners, cough medicines, tonics.
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With metal you can decorate every inch of package surface . . . in any color combination imaginable. Nothing can replace the good impression metal makes. Continental's experience in metal decoration is both wide and deep. The artistry of our craftsman is unexcelled. Let us show you what we can do for your product line.

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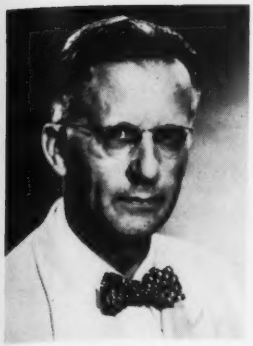
Eastern Division: 100 E. 42nd St., New York 17
Central Division: 135 So. La Salle St., Chicago 3
Pacific Division: Russ Building, San Francisco 4
Canadian Division: 5595 Pare St., Montreal, Que.



Left to right: Dr. Walter C. Meuly, director of research for Rhodia, Inc.; Dr. Martin T. Leffler, director of exploratory research along with his position as head of nutritional research and the research farm,

Abbott Laboratories; Dr. Kenneth E. Hamlin, director of chemical research, and Dr. Robert W. Rivett, director of development, both also for Abbott Laboratories.

sell T. Smith, who is on a military leave of absence. Mr. Field had been a research chemist for the Ferro Corporation.

Claude L. Alexander, who has served as vice-president in charge of sales of the **Bradley-Sun Division of American Can Company,** has been appointed vice-president and general manager of the division, replacing Kenneth M. Leghorn, who has resigned.

A. O. Raven, formerly Emulsol sales manager, recently became products manager of the Emulsol products line at the same time that the **Emulsol Chemical Corporation** merged with Witco Chemical Company, of which Emulsol was a subsidiary.

Dr. Walter C. Meuly, formerly research associate in organic (synthetic) chemistry at the Jackson Laboratory of E. I. DuPont de Nemours, has joined **Rhodia, Inc.,** as director of research.

S. B. Penick & Company has appointed W. E. Jennings and O. J. Hance, both long associated with the company, as full-time sales representatives of the NYQ Chemical Division.

J. L. Huck, Jr., formerly assistant to the marketing and advertising director, **Merck Sharp & Dohme, Division of Merck & Company,** has become marketing director for the division.

Kay Reed has been appointed merchandise manager of **Parfums Ciro.** Mrs. Reed had been director of advertising and public relations with the Lady Esther Division of Chemway Corporation.

J. Stanley Probst, formerly president of the Maryland Pharmaceutical Company, has been appointed assistant to Thomas F. McNulty, president of radio station **WWIN, ABC's affiliate** in Baltimore.

Shareholders of **Eli Lilly and Company** have elected two members to the board of directors: A. J. LeBien, vice-president in charge of marketing, and William R. Spurlock, vice-president and assistant to the president. Mr. LeBien joined Lilly in 1929, and Mr. Spurlock in 1924. Robert J. Manning, with the firm since 1947, most recently in the position of manager of the promotion planning and media department, has been named administrative assistant to the executive director of merchandising. He is succeeded by Owen A. Traylor, who has served as administrative assistant in the advertising and sales promotion division since 1957.

John Brennan, formerly president of the Gray Pharmaceutical Company, is now president and director of the newly formed **Hoyt Pharmaceutical Corporation,** founded to serve as a pharmaceutical adjunct to the Boston Medical Center. H. R. Hoyt, New England industrialist, is chairman of the board. Other officers are: Marcus G. Grodberg, vice-president and director of research and development; Morris Ringer, M.D., medical director; Abraham Wolbarsht, M.D., director of clinical research. Consultants are Francis L. Colpoys, M.D., Boston internist and clinician, consultant in medical research; and John T. Murphy, Ph.D., pharmaceutical consultant.

Three newly created staff positions in the **Denver Chemical Manufacturing Company** have been filled: William F. Kremer, M.D., formerly associated with Geigy Pharmaceuticals, is medical director; Felix A. Jehle, who has been associated with Warner - Lambert Pharmaceutical Company and E. R. Squibb & Sons, is production manager, and will also supervise development of specialized tableting techniques; and Harold Breslow, for several years production manager for Organon, Inc., is administrative assistant to the director of research, Bernard J. Brent.

John P. McDonnell has been promoted to the position of assistant chief manufacturing chemist for **John H. Breck, Inc.** Also promoted is William L. Burlingham, from shipping supervisor to supervisor of all warehouse activities.

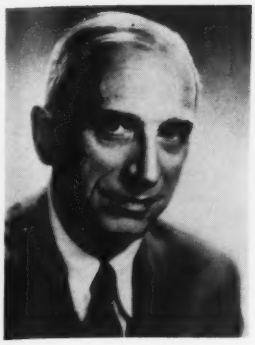
Hazel Bishop, Inc., has appointed Herman L. Johnson executive vice-president. With the firm since 1955, Mr. Johnson has been in charge of sales until his new appointment.

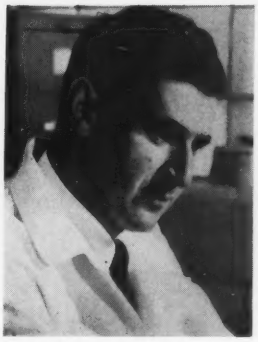
Dr. Martin T. Leffler, associate director of research for **Abbott Laboratories** since 1950, has been appointed director of exploratory research. He continues in charge of nutritional research and the research farm. Former assistant director of chemical research, Dr. Kenneth E. Hamlin has been appointed director of chemical research, and Dr. Robert W. Rivett has been named director of development. He has been with Abbott since 1946, most recently as manager of development laboratories.

Perry Brothers, Inc., has appointed G. W. Radford as Canadian sales representative. Mr. Radford was formerly with the Green Cross Division of Sherwin-Williams Company.

Frank J. Scinto, former sales contractor for Upjohn International Operations, Inc., has been appointed marketing coordinator for **Upjohn Overseas Corporation,** with headquarters in Colon, Free Zone, Panama.

Comfortime
The divine enchantment of the scent COMFORTIME ... hinted in music, never expressed by words. A perfume of enduring beauty for the sophisticated connoisseur.
Florasynth LABORATORIES, INC.
CHICAGO 6 • NEW YORK 62 • LOS ANGELES 21
San Francisco • San Bernardino
Max. S, A. Mexico 1, D. F.





From left to right: Dr. Oskar P. Wintersteiner, director and administrator of the new division of biological chemistry, and Dr. Josef Fried, director of organic chemistry, Squibb Institute for Medical Research; Lamson

M. Scovill, eastern district sales manager for Scovill Manufacturing Company, and John H. Gelwicks, formerly a salesman in the Chicago area, now Scovill's western district sales manager.

Three appointments have been made to the **Tussy Cosmetic Division of Lehn & Fink Products Corporation:** William P. Schliemann, assistant sales manager, now also in charge of sales forecasting and marketing research; Neil B. Barkell, formerly with Helene Pessl, Inc., as sales administrator; and Robert Muecke, formerly with Schenley Industries, Inc., sales promotion manager.

Puzant Crossley Torigian has been elected president and general manager of **Marvin R. Thompson, Inc.** Mr. Torigian joined the firm as assistant to the president a little over a year ago.

Upon reorganization within the chemical divisions of **Squibb Institute for Medical Research,** two appointments have been made. Dr. Oskar P. Wintersteiner, formerly director of the division of organic chemistry, is director and administrator of the new division of biological chemistry. Dr. Josef Fried, with the Squibb Institute since 1944, has been appointed director of organic chemistry.

William L. Searle, who has most recently served **G. D. Searle & Company** as staff assistant to Franklin P. O'Brien, vice-president in charge of distribution, has been appointed director of medical service. The firm was founded 71 years ago by Mr. Searle's great-grandfather, Gideon D. Searle. Mr. Searle succeeds Harry M. Smith, who has retired because of ill health.

Lamson M. Scovill, who has been with the **Scovill Manufacturing Company** since 1932, most recently serving as salesman for cosmetic containers in the New York area, has been appointed eastern district sales manager. Mr. Scovill is first vice-president of CIBS. John H. Gelwicks has become the western district sales manager. Mr. Gelwicks, with Scovill since 1945, was formerly salesman for cosmetic containers in the Chicago area.

Frank L. Stamberg, formerly assistant to the president of Vick Chemical Company and before that associated with **Prince Matchabelli, Inc.,** has rejoined Matchabelli as manager of brand operations, including Polyderm Cosmetics, Simonetta Perfumes and Black Watch Grooming Aids, as well as of new products and market research.

Seth R. Schneible has joined **Crown Cork & Seal Company, Inc.,** as manager of aerosol products sales. Gilbert W. Wiessner, with Crown for 18 years, has become sales representative for North Carolina. In the company's newly formed central sales region, Harvey C. Tull, formerly consolidated sales manager at the Philadelphia office, has become regional sales manager. Mark T. Concannon, former manager of closure sales for the middle Atlantic region, has succeeded Mr. Tull in Philadelphia, and George P. O'Brien, manager of can sales for the middle Atlantic region, has also taken on closure sales in the same area.

Albert E. Ritchie, with **Colgate-Palmolive Company** for 28 years, has been made manager of the Wildroot department of the **Toilet Articles Division.** Most recently he served as vice-president of marketing for Wildroot.

Dr. Joseph R. Stevens, executive vice-president of **J. T. Baker Chemical Company,** has been elected president of the company, which is a

Left to right: Frank L. Stamberg, new manager of brand operations, new products and market research for Prince Matchabelli, Inc.; Seth R. Schneible, manager of aerosol products sales, Crown Cork & Seal Company, Inc.; Harvey C. Tull, regional sales manager, and George P. O'Brien, now manager of both can and closure sales, in the middle Atlantic region both also for Crown Cork & Seal Company.

SPOTLIGHT ON BIOTIN

A series devoted to brief facts about the vital health-giving vitamins.

An integral part of the vitamin B-complex, biotin is known to protect against the dietary deficiency disease called "egg white injury." There is some indication that the vitamin plays a part in fat metabolism. Recent clinical data indicate an apparent relationship between biotin in the diet and certain dermatitic lesions of infants. It has also been found of value in veterinary medicine in overcoming certain conditions affecting poultry, dogs, birds, and dairy calves.

The empirical formula for biotin is $C_{10}H_{16}O_3N_2S$. It has also been known as vitamin H and coenzyme R. The vitamin crystallizes in colorless needles.

d-Biotin is required for the growth of bacteria, plants and animals. It appears to be related to the process of cell development. The *d*-biotin content of embryo and tumor tissue is comparatively high. Nerve tissue growth is greatly stimulated in the presence of certain concentrations of *d*-biotin.

The paragraphs above have been excerpted from a review of existing knowledge of the vitamin published by the Roche® organization. If you wish a copy of this brochure, without charge or obligation, please send your request to the Vitamin Division.

If you are engaged in the manufacture of food or pharmaceuticals, our technical service is at your disposal . . . in confidence, of course.

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From left to right: Carl K. Raiser, newly appointed assistant to the president of Smith, Kline & French Laboratories; George D. Pickett, technical service representative for the Western Condensing Company; Robert F. Geissler, new products marketing manager of the Family Products Department of Chas. Pfizer Laboratories; and John T. McLoughlin, who is now vice-president and general manager, Nutritional and Pharmaceutical Division of Mead Johnson & Company. He had been vice-president of marketing and development planning.

wholly owned subsidiary of **Vick Chemical Company.** Dr. Stevens joined Baker as director of organic research in 1944.

Carl K. Raiser, former director of distribution for **Smith Kline & French Laboratories** and current president of the National Pharmaceutical Council, has been named as assistant to Walter Munns, president of the company. Mr. Raiser is succeeded by G. Frazier Cheston, who was previously in charge of SKF's hospital sales. The former manager of the public relations department, G. Frederick Roll, has become director of public relations. Succeeding Mr. Roll as manager is William L. Grala, Jr., who has been assistant manager of the public relations department. Appointed an assistant to the president, in charge of new products administration, is David W. Clark. In the newly created medical service department, the director of medical affairs is Theodore B. Wallace, who is responsible for SKF contacts with the FDA. Head of the new clinical investigation department is medical director Dr. Maurice R. Nance. In the marketing division, James S. Smith has been appointed to the newly created position of assistant manager. He is succeeded as manager of the division's promotion planning department by William S. Pilling, previously assistant manager.

George D. Pickett has joined **Western Condensing Company** as technical service representative for Foremost Lactose in applications to the food industry.

Albert E. Woeltjen, M.D., has been named associate medical director of **Pfizer Laboratories, Division of Chas. Pfizer & Company, Inc.** He will also serve as consulting editor to Pfizer Spectrum, a monthly magazine for physicians. Robert F. Geissler has been named products marketing manager for the Family Products Department of the firm, and three appointments at three plants have also been made: John L. Watters, M.D., who was with the Greenville Clinic in Greenville, N. C., has become new products coordinator in the new products coordination department at Brooklyn; Ernest J. Bianco has come as a research chemist to the chemical research department at Groton, Conn., from Shea Chemical Corporation, to which he had gone after serving for six years as a research chemist for Pfizer; and Harry D. Hastings, now electrical engineer in the engineering department at the Vigo plant, Terre Haute, Ind. Charles T. Haffey is now assistant director of purchases at Brooklyn; George J. Kaiser succeeds Mr. Haffey as purchasing agent at Groton; and Robert C. Born succeeds Mr. Kaiser as purchasing agent at the Vigo Plant.

John T. McLoughlin has been appointed vice-president and general manager of the **Nutritional and Pharmaceutical Division of Mead Johnson & Company.** He has been with the firm's division since November, 1958, as vice-president, marketing development planning.

C. H. Taylor, formerly president of Taylor Laboratories, Inc., has become vice-president and general manager of **Dumas Milner Corporation** which has acquired Taylor as a division. T. H. Coulter, formerly vice-president of Taylor, is vice-president of sales and advertising for the division. Five new division salesmen have been appointed: William R. McBride, Steve Laboda, Patrick F. Golden, Samuel K. Marshall and Robert J. Norwood.

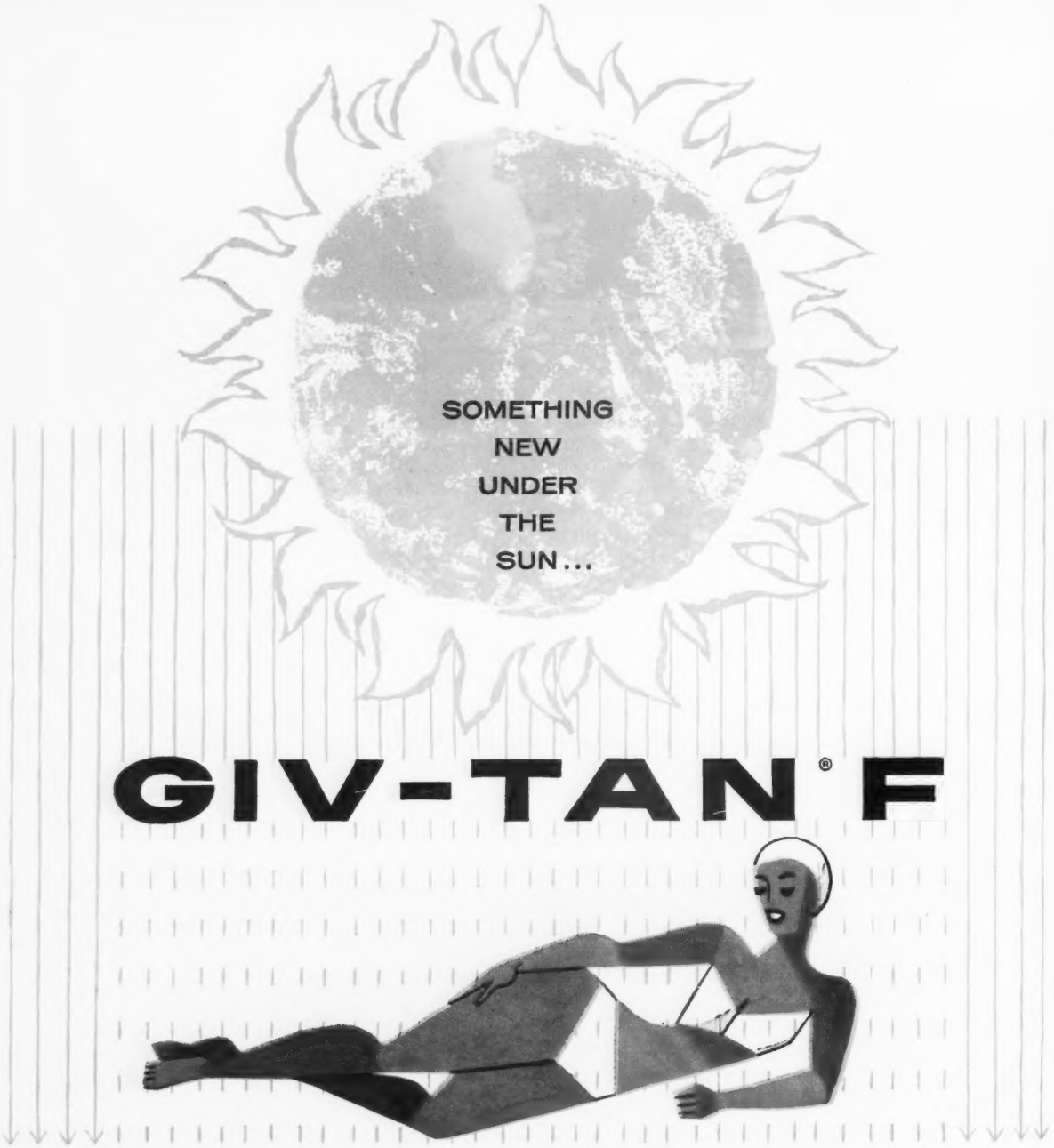
Nachod Receives French Award

Dr. Frederick C. Nachod, a chemist at Sterling-Winthrop Research Institute, has been awarded the Order of Merit of France's Society for Encouragement of Research. The annual award, sponsored by France's Ministries of Education, Industry, Commerce, and Public Health, goes to Dr. Nachod for his international contributions to physical, organic and medicinal chemistry. Presentation will take place this spring.

Tillman Retires

Paul E. Tillman, senior vice-president and a director of G. D. Searle & Company of Chicago, will retire on May first after 27 years with the company. In announcing his retirement to shareowners, Mr. Tillman said that he would like to devote the balance of his career to public service in Park Ridge and the Skokie Valley, and to recreation.

PAUL E. TILLMAN



GIV-TAN® F

GIV-TAN F is a new sunscreening agent developed by Sindar's research laboratories to increase the efficiency and sales appeal of your suntan product. It enables you to provide maximum sunburn protection—and the deep, lasting, bronze-like tan your customers want—at savings up to 50%!

GIV-TAN F is easy to use. Being a miscible oil, it dissolves and mixes readily in all media normally employed for sunscreen preparations. As an oil it offers special qualities that enhance the cosmetic elegance of your product.

GIV-TAN F is stable in solution and under exposure to sunlight...proved in field and laboratory tests...harmless to fabrics...non-irritating to the skin. It is extremely economical in any type of suntan preparation or sunburn preventive—in hydro-alcoholic solutions, oils, lotions, creams and other products.

We are ready to give you complete information on GIV-TAN F and full cooperation in using it to the best advantage in your preparations.

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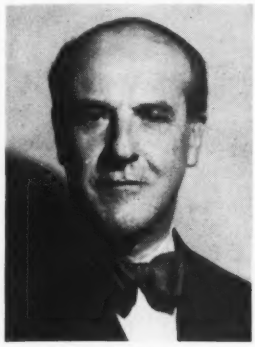
The de Laires Return to France

Francois de Laire, head of Fabriques de Laire of France, has returned to France with his son Antoine. The two had been visiting friends and business acquaintances in this country and Canada, and



FRANCOIS DE LAIRE

had brought with them a collection of the most recent creations from the laboratories of Fabriques de Laire.

Gaudry Receives Pariseau Medal

Dr. Roger Gaudry, director of research, Ayerst Laboratories, has been awarded the Pariseau Medal for his contributions to scientific knowledge in biologic chemistry, specifically in the study of amino acids, in which field he has developed new methods for synthesizing natural amino acids for nutritional studies.

The medal is awarded annually by the French-Canadian Association for the Advancement of Science

Milner Acquires Taylor Labs.

The Dumas Milner Corporation of Jackson, Miss., has entered the pharmaceutical field with the acquisition of Taylor Laboratories, Inc., of Houston, Texas, in a straight cash transaction.

C. H. Taylor, president of Taylor, is joining Dumas Milner Corporation as vice-president and general manager of the newly formed Taylor Laboratories Division of the company. T. H. Coulter, formerly vice-president of the drug company, has been appointed vice-president of sales and advertising for the division.

Five field salesmen have been appointed for the drug division: William R. McBride, Steve Laboda, Patrick F. Golden, Samuel K. Marshall and Robert J. Norwood.

W. Lambert Elected an Honorary Member of BIMS

Peter L. Forsman, chairman of the executive committee of BIMS (Buyers, Importers, Manufacturers, Salesmen) of New York, has announced the unanimous election of William Lambert as an Honorary Member.

Mr. Lambert, senior editor of the *American Perfumer and Aromatics*, has been a member of BIMS since its inception 25 years ago.

Pharmaceutical Educators Elect Officers

John J. Toohy, general manager of E. R. Squibb & Sons, Division of Olin Mathieson Chemical Corporation, was elected president of the American Foundation for Pharmaceutical Education at its annual meeting on March 5.

John G. Bill, president, Merck Sharp & Dohme, Division of Merck & Company, Inc., was elected vice-president; Carl K. Raiser, assistant to the president, Smith Kline & French Laboratories, is the new treasurer; James F. Hoge, Roger, Hoge & Hills, was re-elected counsel; and W. Paul Briggs was re-elected secretary.

Members of the finance committee are: L. D. Barney, Alvin G. Brush, Charles D. Doerr, Lyman C. Duncan, Carl K. Raiser and C. R. Walgreen, Jr.

John E. McKeen, president, Chas. Pfizer & Company; T. F. Davies Haines, president, Ciba Pharmaceutical Products, Inc.; S. Barksdale Penick, Jr., president, S. B. Penick & Company; and Louis C. Zopf, dean, College of Pharmacy, State University of Iowa, were elected directors.

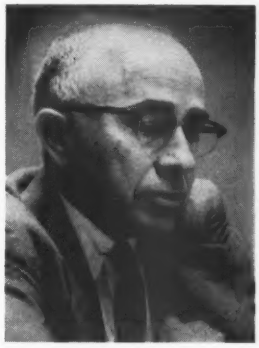
Directors re-elected are: George B. Burrus, president, Peoples Drug Stores, Inc.; H. Smith Richardson, Jr., president, Vick Chemical Company; George F. Smith, president, Johnson & Johnson; Mr. Toohy; and Edward T. T. Williams, chairman, executive committee, Warner-Lambert Pharmaceutical Company.

SCC Library Moved

Harry Isacoff, chairman of the library committee of the Society of Cosmetic Chemists, has announced the removal of the Society's library to the Chemists' Club, 52 East 41st Street, New York City 17.

SCC Honors Dr. Blank

Dr. Irvin H. Blank, Associate in The Department of Dermatology, Massachusetts General Hospital of Boston, is the recipient of the Society of Cosmetic Chemists' Special Award for 1959.



IRVIN H. BLANK

After graduating from the University of Cincinnati from which he received the Ph.D. degree, Dr. Blank then studied at the Harvard Biological Laboratories, which led to his association with the Department of Dermatology at Harvard Medical School.

The award is to be presented during the Society's May 7 meeting.

Perfumers Honoring Dr. Jellinek

The American Society of Perfumers has voted to grant honorary membership to Dr. Paul Jellinek of Polak's Frutal Works in recognition of his contributions to the field of perfumery. The honor will be conferred during the 5th annual open symposium of the Society, April 20.

Punnar Honored by Fritzsche

Fritzsche Brothers' Quarter-of-a-Century Club gained a new member on March 7, when Arthur Punnar, head of the firm's printing department, celebrated at a luncheon in his honor at Charles Restaurant. He was presented with a Government bond and scroll by the firm's officers and directors, and a gold watch by his fellow employees.

E. Shiftan in Europe

Ernest Shiftan, vice-president and chief perfumer, van Ameringen-Haebler, Division of International Flavors & Fragrances, Inc., is visiting company plants in England, Holland and France to study overseas creative operations.

The photograph that graced Shulton's 1958 annual report, showing, as his many friends will recognize, Dr. Oliver L. Marton plying his art. He has been elected 1959 president of the American Society of Perfumers.

In tribute to his firm's 50th anniversary, Max Factor (second from left) receives the Los Angeles Chamber of Commerce special business achievement award from Chamber President J. E. Fishburn, Jr., at ceremonies during the regular board of directors meeting, also attended by vice-president Louis Factor (right) and executive vice-president Max Firestein (left). The engraved plaque cites the company for its contributions to the southland's business economy.

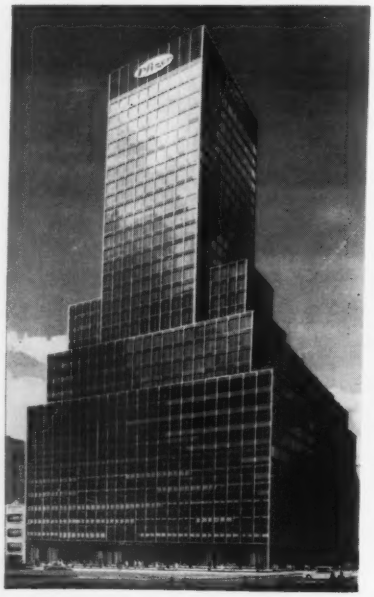
Cutter Buys Two Concerns

Cutter Laboratories has signed an agreement to acquire the assets of Olympic Plastics Company, Inc., and Olympic Containers, Inc., of Los Angeles, California. The assets of both companies were acquired in exchange for Class A common stock of Cutter. The present management and staff will continue.

William Lang Honored

Friends and associates recently honored William I. Lang, southwest regional sales manager, Crown Cork & Seal Company, for more than 35 years of service. S. V. Tuttas, vice-president, sales, presented Mr. Lang with a ruby-studded gold lapel pin.

The Pfizer building to be completed in the spring of 1961 at 235 East 42nd Street, New York City. It will serve as world headquarters for Chas. Pfizer & Company, Inc.



Penick Announces Chicago Changes

S. B. Penick & Company has purchased the property at 735 West Division Street, Chicago 10, which has been its headquarters for many years. The midwest sales activities of the NYQ Chemical Division are now centered there.

W. E. Jennings and O. J. Hance, both long associated with the firm, have been appointed full-time sales representatives of that Division. Ralph A. Olson continues as vice-president in charge of midwest activities. The new telephone for the NYQ Chemical Division is MOhawk 4-5651.

Warner-Lambert Forms Cosmetics And Toiletries Division

President Alfred E. Driscoll of Warner - Lambert Pharmaceutical Company has announced the formation of a Cosmetics and Toiletries Division, to be headed by George J. Abrams. The new president and chief executive officer was formerly advertising vice-president of Revlon.

In his new position, Mr. Abrams will have full responsibility for Warner-Lambert's Richard Hudnut, DuBarry and Sportsman lines.

Zenith Moves to Larger Quarters

Zenith Laboratories, Inc., is now occupying its new and larger plant at 150 South Dean Street, Englewood, New Jersey. The new set-up includes modern high-speed machinery capable of turning out disintegration capsules and tablets, coated and uncoated tablets and hard gelatin capsules in large volume, in the shortest time, at low cost. A laboratory is being installed.

Witco Merges Emulsol with its Organic Chemicals Division

Witco Chemical Company has merged its subsidiary, Emulsol Chemical Corporation, and its Organic Chemicals Division, with the major purpose of widening distribution of Emulsol products through the parent company's sales force.

Emulsol's sales staff will be absorbed by the Witco organization, and A. O. Raven, formerly Emulsol sales manager, has been appointed products manager of the Emulsol products line.

The Emulsol laboratories are being consolidated with Witco's research and development laboratories at 6200 W. 51st Street, Chicago; the plant remains at 1914 S. Kilbourn.

Glass Companies Merge

Glenn A. Mengle, chairman, and Finley B. Hess, president of Brockway Glass Company, and O. C. Noble, president of Tygart Glass Company, have issued a joint statement that the directors of the two companies have agreed on a statutory merger that would make Tygart a wholly owned subsidiary of the Brockway firm. The agreement is effective, pending a ruling by the U. S. Treasury Department and a vote of approval by the stockholders. Transfer of ownership has been negotiated on a stock dollar for dollar agreement with no additional cash amount involved. Common and preferred stock will be exchanged in proportion to the ratio held by Brockway stockholders.

No changes in personnel are contemplated, except to add a Tygart representative to the Brockway board of directors.

PACKAGE YOUR PRODUCT TO PLEASE IN ALUMINUM AEROSOLS BY WIRZ

New

Convenient aerosols in handy new "personal" sizes assure added sales appeal for a wide variety of products . . . now *beautifully* at home in boudoir, travel bag or bathroom shelf.

Wirz improvements in aerosol design and manufacture meet your most exacting packaging requirements, too. Wirz aluminum aerosols are light in weight, completely rust-free . . . newly engineered to provide easier, simplified dispensing of cosmetics, pharmaceuticals and household specialties. Seamless, one piece construction eliminates any possibility of leakage . . . insures positive protection for your liquid or semi-liquid product formulations.

Wirz packaging specialists are prepared to produce aluminum aerosols promptly and economically . . . to your particular design and size specifications. Contact your Wirz representative or write for complete data on *new* aluminum aerosols by Wirz.

801

Another Development by America's Leading Producer of Collapsible Metal Tubes

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ALSO RIGID CANS & IMPACT EXTRUSIONS—AMERICAN EXTRUSION DIVISION
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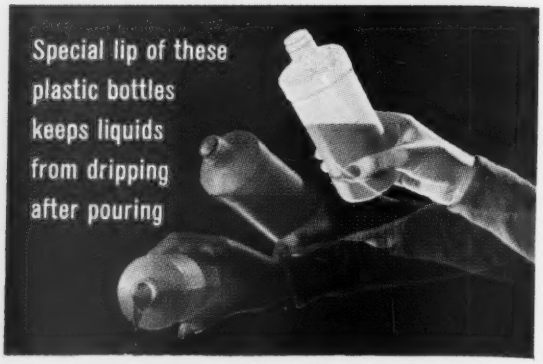

New type of plastic bottle by Owens-Illinois is feather-light, rugged, versatile, economical

The semi-rigid blown plastic bottles shown here are a few of the shapes, sizes and colors possible with this new Owens-Illinois process.

Semi-rigid blown plastic containers are extremely lightweight, durable, and easy to handle . . . both on your filling line and in consumer use. The special lip prevents liquids from dripping after pouring.

Yet with all these packaging and merchandising advantages, Owens-Illinois rigid blown plastic containers are low in cost . . . compare favorably with most other packages.

Find out how these containers can help you . . . call the Owens-Illinois sales office nearest you.

PLASTIC CONTAINERS
AN (O) PRODUCT

OWENS-ILLINOIS
GENERAL OFFICES · TOLEDO 1, OHIO

Charlotte Haas Married

Charlotte Haas, associate editor of *Soap and Chemical Specialties*, became Mrs. Otto Schueller on March 10. The couple's address is 285 Riverside Drive, New York City 25.

Bernstein and Kleinfeld Firm Founded

Vincent A. Kleinfeld, formerly Special Assistant to the Attorney General of the United States and Chief Counsel, Committee of the U. S. House of Representatives to Investigate the Use of Chemicals in Food and Cosmetics, and Sheldon E. Bernstein, formerly with the U. S. Department of Justice and Securities and Exchange Commission, and more recently in general practice in the District of Columbia, have become associated in the general practice of law under the firm name of Bernstein and Kleinfeld. The office is in the Pennsylvania Building, Washington 4, D. C.

Breck Company Celebrates 50th Anniversary

A service award party commemorating the 50th anniversary of John H. Breck, Inc., was recently held at the Springfield, Mass., Country Club. Service award pins were presented to 45 employees of the firm.

During the ceremony, Robert L. Warren, Jr., vice-president of the Brockway Glass Company, presented to Dr. John H. Breck, Sr., founder and chairman of the board of Breck, a photograph in full color of the directors of the Breck company, in recognition of the long and highly satisfactory relationship between the two firms.

Hoyt Pharmaceutical Corp. Established in Massachusetts

A new ethical pharmaceutical specialty manufacturer, the Hoyt Pharmaceutical Corporation, has been formed in Newton, Mass. John Brennan, formerly president of the Gray Pharmaceutical Company, is president and H. R. Hoyt, a New England industrialist, is chairman of the board.

Founded to serve as a pharmaceutical adjunct to the Boston Medical Center, the company will offer grants-in-aid. Its research staff will undertake studies in association with a number of medical and teaching institutions.

Licensed pharmacists and pharmacy students in training at the Naval Pharmacy School, Portsmouth, Va., during their recent day-long visit to the research laboratories, manufacturing and packaging departments as guests of A. H. Robins Company, Inc., in Richmond. President E. Claiborne Robins, center, was host for the tour. The 62 men also met the firm's medical staff.

Other officers of the new firm include: Marcus G. Grodberg, vice-president and director of research and development; Morris Ringer, M.D., medical director; and Abraham Wolbarsht, M.D., director of clinical research.

Sabine Honored

David B. Sabine, research group leader at U. S. Vitamin & Pharmaceutical Corporation, has been elected to Sigma Xi, national scientific honor society.

Industrial Raw Materials Company Formed

A new company known as Engineered Materials has been formed with Alice Josephine Gitter as president, at 509 Fifth Avenue, New York City 17. The company will supply industrial raw materials of special properties and qualities especially in the ceramic, ferrite, powdered metals, plastics, rubber, pharmaceutical and cosmetic fields. Chemicals, non-metallic minerals and select metals may all be obtained in powdered form, and liquids for density determination up to 6.0 and optical pyrometers are also available.

Miss Gitter, a graduate ceramic engineer, has served in a variety of capacities including her position as a ceramic engineer with American Encaustic Tiling Company, as research and consulting engineer for W. H. Loomis Talc Company and, during the war years 1943-1945, as Chief, Clay-Talc Unit of the War Production Board. For the past year she has been director of market research for the United Mineral and Chemical Company.

Hibbard O. Ball

Hibbard O. Ball, executive vice-president of Pitman-Moore Company, died suddenly in Toronto, Canada, March 13. He had been attending a meeting of the board of directors of the company in Canada, and had suffered a heart attack two days before his death. Mr. Ball, who was 54 years old, had been with Pitman-Moore since 1927, when he served as a medical service representative in Detroit.

He was also a member of the board and secretary of Allied Laboratories of Canada, as well as a member of the board of Campana Company, another division of Allied Laboratories.

Richard E. Doolittle

Richard E. Doolittle, vice-president of Sterling Drug Company's Glenbrook Laboratories Division, New York, died March 18 in Danbury, Conn. Mr. Doolittle was 63 years old.

Mr. Doolittle had been associated with Sterling for 26 years in various managerial capacities, most recently as divisional vice-president of Glenbrook in charge of production and distribution.

John Stauf

John Stauf, manager of the northeast district for the chemical department of McKesson & Robbins, Inc., died in New York on March 10 at Brooklyn Hospital.

Mr. Stauf had been with McKesson & Robbins since 1952. Long active in the industry, he was formerly executive assistant to the president of Solvay Process Division, Allied Chemical Corporation.

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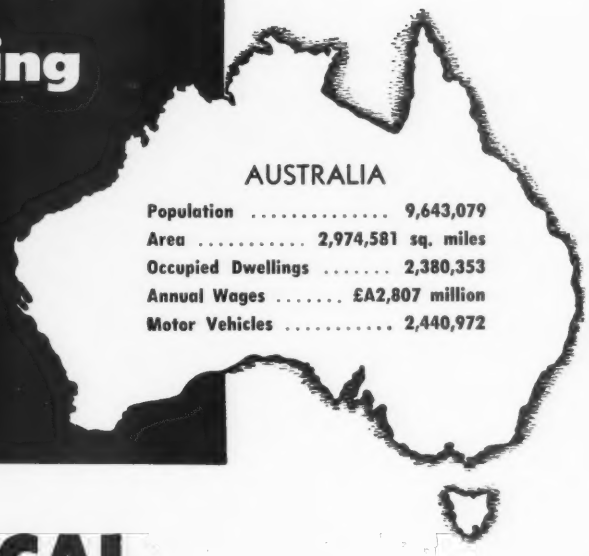

THE CHEMICAL HOLDINGS GROUP

Chemical Holdings Pty. Ltd. is the parent company of a group of wholly owned subsidiaries encompassing the manufacture, sales promotion, advertising and distribution of pharmaceutical and allied products. With 30 years' experience in its field, Chemical Holdings offers to overseas principals a service unequalled throughout the Commonwealth. Overseas firms interested in establishing themselves in Australia are invited to consult us. The Company, upon request, will investigate and report on all aspects of the market without obligation. All enquiries addressed to the Managing Director will be treated in the strictest of confidence.

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. . . that's the production capacity of the new Stokes Model 551 Rotary Tabletting Press at 3750 tablets per minute.

This is the highest production rate in the industry—achieved with a machine no larger than the well known Stokes Model 540—and without increase in head speed. A new die locking arrangement, called Chord-Loc, permits 51 stations of tooling to be used in a punch circle the same diameter as that of the 540. What's more, you don't have to retool for the 551—it uses the same standard punches and dies as the 540--41 station, and the BB-2—33 and 37 station presses.

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STOKES

Management Forum

BY FRANCIS CHILSON
INDUSTRIAL CONSULTANT

Wage Incentives

Those of you who have followed these comments for the past several years know that I have always been opposed to wage incentive plans. I have never encountered a really good one in 30 years of consulting practice. I have been instrumental in throwing out many incentive plans, thereby effecting substantial increases in production and tranquilizing disturbed labor relations. My objections to incentive systems are based on the fact that these systems are usually established by efficiency outfits (management engineering is the more modern term) that know nothing about the industry, its products, processes or equipment. Hence the rates are invariably set on the wrong premises.

My objections are based on frequent observations that too often rates systems cause bad labor relations because of continual and often unfair revision of rates.

I have also noticed that most of the engineers who make time and motion studies have no conception of the right way to set up jobs, are poor observers and worse gadgeteers. They blindly set rates on operations that are fundamentally wrong in every respect. Too many wrangles occur between management and labor when rates are revised downward, as they inevitably are.

Management often fails to reckon the cost of installing the system and maintaining the clerical and engineering help necessary to keep it operating as a contra against savings. Consequently, management is often disappointed when the net savings from the system are small indeed.

Supervision is impaired because foremen and gang bosses no longer feel that it is necessary to study critically every operation in their departments and to keep pressing for increased production because they feel the system will automatically accomplish all this. They hesitate to make improvements because improvements precipitate rate changes.

When rates are not frequently revised, workers find means of beating the system without additional effort, and when rates are too frequently revised there is always a row. Shoddy workmanship and carelessness can often be traced directly to an incentive rate system.

When work is not amenable to any sort of mechanization or gadgeteering, incentive rates may help a little—if the work centers and set-ups are soundly conceived and adequately supervised. But I look askance at every attempt to apply incentive rates to mechanical operations and even hand operations where supervision is good and the volume is sufficient to permit ingenious gadgeteering.

I have argued the question pro and con with my friends for years. When put to the test, as I have been on many occasions, I have demonstrated that incentives were not necessary to increase production substantially.

Since management engineers in general are protagonists for rate systems, I was amazed to discover in the May issue of *Management Methods* an article by T. H. Martzloff of Kinsey & Co., supporting the point of view I have held for years!

Says Mr. Martzloff, "Experience shows they [wage incentives] don't always produce the desired results. In fact the result can be quite the reverse of what is hoped for. . . . Experience shows that incentive programs can add fuel to an already smouldering fire by providing causes for grievance, causes for poor morale and attitude, causes for work slow down or outright strike. . . . Management must be ready to shoulder the overhead essential to an efficient and effective program. The continuing expense of maintaining labor standards and administering a wage payment program often surprises companies with newly established incentive systems. Rapidly changing technology demands that jobs be restudied by a

3 ways to PRECISION LABELING

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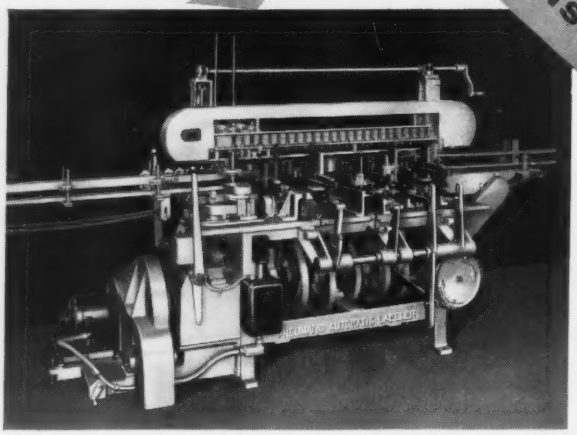
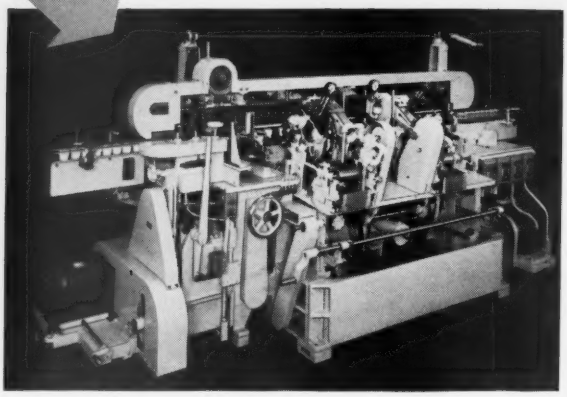
DIREC-TRANSFER

Portable bench type labeler for convenient application to wide range of shapes in glass, boxes, cartons, books and other objects. Offers full-surface gluing for high quality results. Changing from one job to another is a simple procedure, taking a maximum of five minutes.

Basically a semi-automatic unit, this model is easily made automatic by the use of available auxiliary attachments. Designed by Jagenberg of Dusseldorf, this precision built labeler is sold exclusively in the United States by Pneumatic.



This 4" Simplex unit is one of several models offered by Pneumatic as standard labeling equipment for over thirty years. Using 'glue on bottle' method for label pick-off, the McDonald Labeler has proved its efficiency in literally hundreds of installations. All models are well equipped with safety devices to prevent loss of production time and materials. Round, oval or rectangular shapes may be run with front only or both front and back labels being applied simultaneously.



Duplex in action, this Labeler handles two containers at a time for front only or both front and back application. A three-station indexing turret with suction pads picks labels off bottom of label stack as turret revolves in counter-clockwise direction. Each label receives thin, uniform coating of adhesive from roller and is given time to "temper" as it travels to next station. At final position of turret, the label is transferred directly, through contact, to bottle. Continuous straight-through intake provides gentle handling of glassware, and bottles are in positive control throughout labeling process. Equipment includes "no bottle, no label" and "no label, no glue" safeties.

PNEUMATIC SCALE CORP., LTD., 70 Newport Ave., Quincy 71, Mass. *Also: New York; Chicago; Dallas; Rochester; Seattle; San Francisco; Los Angeles; Rockwell Pneumatic Scale Ltd., London N.W. 2, England; Paris, France. Subsidiaries: Delamere & Williams Co., Ltd., Toronto; Carbert Mfg. Co., Inc., Cambridge, Mass.*

★PNEUMATIC *Packaging and Bottling Equipment*

corps of salaried industrial engineers, that new methods be established, that new job standards be developed constantly. Such maintenance activities are a 'must' if incentives are to work effectively in the company's best interests. And clerical costs of administering sometimes complicated payment plans also need careful study. It is too easy to underestimate these dollar costs in calculating incentive plan payout. . . . Even these kinds of expense do not include hidden costs involved in grievance handlings, in discussion of controversial issues, or the cost involved in making special studies and analyses required to solve difficult management-worker problems."

Protection for Free Trade Among Free Peoples

The pharmaceutical and chemical industries should ponder deeply the potential consequences to their business if some day soon Russia should start dumping chemicals and pharmaceuticals into this country at below manufacturing cost, as she has already dumped chemicals and steel in several Asiatic countries. It must never be forgotten that when Russia can see political advantages to be gained she can give away the products of any of her industries for nothing if need be. Certainly she can at any time sell any of her products at far below our cost of manufacture. The Germans did this to us before World War I with respect to chemicals. The Russians are far less scrupulous and are playing for vastly bigger stakes. The time when Russia will be able to do this is not far off—ten or 20 years at most, considering the rapidity with which her economy is growing. The time for us to act is now.

It is now, and will become increasingly, more stupid for us not to trade with Russia. She has all manner of raw materials and later will have all sorts of manufactured goods that we need and will want—but not at prices that will ruin our own industries. We should all work together to change the tariff laws in a manner similar to the way the immigration laws were changed in 1924. As everyone knows, these laws were changed to restrict the immigration of the less desirable peoples of southern and eastern Europe, Asia and Africa, and to give preference to the nationalities that predominated in our population in 1890, principally, English, Irish and German.

We can do the same thing with imported raw and manufactured products. We can increase tariffs to a point that will equalize the landed cost of all imports with our own cost of manufacture from all countries that were not exporting to us in 1930 in dollar amouts above a certain minimum. Clearly this would favor our present allies: England, Germany and Japan; France, Italy and the Scandanavian countries. And these countries should be favored because they have been our best customers for many years. Imports from these countries would be subject only to regular tariffs. But imports from Russian and other Communist countries would be subject to equalizing tariffs.

As I said above, the time to act is now before our stupid State Department politicians make some deals with the Communist countries that would make equalization impossible. Write your senators and congressmen now!

Industrial Espionage

I always feel a bit smug when the *minor* industrial press such as *Fortune* and the *Wall Street Journal* catches up with ideas that have been discussed in this column. On March 3rd the *Wall Street Journal* had an interesting front page article on industrial espionage, a subject that was treated fully in this column a year or two ago. At that time some of my friends expressed doubt that specialized espionage firms actually existed as I had said. I did not name any particular firm but the *Wall Street Journal* did. As a matter of fact several firms specialize in industrial espionage. These thieves use all the paraphernalia of international espionage: wire tapping, miniature cameras disguises, whiskey, women and skillful brain-picking of employees. It is certainly a hell of a commentary on the morals of American management that spies should ever be employed. Such tactics play into the hands of the unions and also give the Communists damaging ammunition to use against us. It makes me retch when I realize that some of the firms in the drug and cosmetic industry have besmirched the industry by employing spies. That's playing dirty pool.

Climatic Medicine

For centuries people have known that climate and weather changes have a noticeable physiologic effect upon them. But it is only within the year that research has been instituted at the University of Arizona and, I believe, Johns Hopkins also to assay the effect of climatic changes upon human health. It has been observed in the Mediterranean countries that crimes of violence increase during the times the sirroco is blowing off the hot Sahara. When people are hot they become irritated easily and when they are irritated they lost their tempers and commit acts of violence. The physiological reaction is worse when the weather is both hot and humid. Hence the effect of weather on human beings is of considerable importance also to psychologists and criminologists. Parenthetically it may be said, in view of what is already known about the reactions of man to climate, that it is difficult to understand why there should be any resistance to air conditioning offices and factories completely.

The research being done may result some day in the development of some novel stimulators which will provide the kick of a cold Tom Collins without the after effects—and without interference with working efficiency. Instead of griping about the weather perhaps one should take two or three aspirin tablets.

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Air cleans up to 40 containers p. m. Companion unit to fillers shown. Request "E-Z Bulletin."

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Precision unit for maximum efficiency. Request "Hand Filler Bulletin".

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- **MODEL B-49 STRAIGHTLINE VACUUM FILLER.** Standard assembly provides 9 filling heads. Adjustable for container changes, ranging in size from miniatures to gallons. All contact parts stainless steel or plastic on order. Supplied with or without discharge conveyor. Request "Bulletin B-49."
- **U. S. SIPHON FILLER.** Adjustable for all containers, all liquids including foamy products or products that do not permit agitation. Has stainless steel tubes; glass lined tank. Request "Siphon Bulletin."

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(Aspro and Bayer and Norwich advertising departments please note. Here's a new 'hook' for you.)

In addition to climatic influences, doctors in hospitals for the insane have long noted the influence of changes in the phases of the moon on their patients. They have noted also the effect of electric storms on patients' moods and behavior. Tranquilizers in such cases have been used with good effect. When researchers fully understand the mental and physical effects of environmental conditions, all manner of new drugs may be created.

Depreciation Write-Offs

On many occasions for a long time past I have urged that a percentage of sales be used for depreciation write-offs, rather than the straight line method. This method is sound and logical because, in times of high sales, facilities are used more than they are at other times when sales are down. Such a method of depreciation write-off is all the more important during inflationary times. It is ridiculous to depreciate an asset on a straight line basis when the replacement value of that asset is constantly increasing. If the controllers of the industry would get their noses out of their books long enough to do something worth while, they could put up a united front against the income tax department and get them to approve this logical method. To some extent there is a precedent for it. Chain stores are allowed to write off rent and depreciation as a percentage of sales, and have been for years. So, it seems to me that it shouldn't be difficult to persuade the tax department to see the logic of the method.

Russia and Us

In spite of all their attacks on the capitalistic system the Communists have not been able to come up with anything better. While loudly decrying the system, they themselves are compelled to use its methods. They use money as a means of exchange even as capitalists do. They have banks, savings accounts, checking accounts, clearing houses and government bonds—which, incidentally, people are *compelled* to buy. They have budget systems, cost systems and accounting systems no different from ours. They probably even have controllers. But they have the advantage of being able to shoot their controllers once in a while when they get too big for their britches, while we have to listen to them. (There are some elements of the communistic system that I am in favor of!) In brief, Russia uses all the mechanisms, tools and methods of the capitalistic system, excepting stock exchanges. In Russia there is no need for stock exchanges because there are no company stocks for sale. The government owns all the companies and it takes 100 per cent of their profits. Our government takes only 52 per cent.

There are other similarities. The individual in Russia works for a wage. As in capitalistic countries, his wage varies with his skill. He is paid bonuses and other incentives for exceptional performance. Then, like us, the poor bastard has to pay high income taxes! What a price we all pay for Systems—economic and political!

Office Rules in the Year 1872

"It is suggested that these office rules be posted on your bulletin board . . . since with several coffee breaks per day, it is impractical, if not impossible, to read these rules to the entire office force at one time!

(1) Office employees each day will fill lamps, clean chimneys and trim wicks. Wash windows once a week.

(2) Each clerk will bring in a bucket of water and a scuttle of coal for the day's business.

(3) Men employees will be given an evening off each week for courting purposes.

(4) After 13 hours of labor in the office, the employee should spend the remaining time reading the Bible.

(5) Every employee should lay aside from each pay day a goodly sum of his earnings for his benefit during his declining years, so that he will not become a burden on society.

(6) Any employee who smokes Spanish cigars, uses liquor in any form, or frequents pool and public halls, or gets shaved in a barber shop, will give good reason to suspect his worth, intentions, integrity and honesty.

(7) The employee who has performed his labor faithfully and without fault for five years, will be given an increase of five cents per day in his pay, providing profits from business permit it."

Chicago Drug and Chemical News
Vol. 14, No. 3. (March 1959)

Small Vial Filler

The Multi-fill Machine Company, 340 N. Westwood Ave., Toledo 7, Ohio, has introduced to the market a small automatic filling machine for precision filling of very small perfume flacons, vials and other containers in size ranges below those of most standard filling equipment. This machine is a plunger type filler similar in principle to a hypodermic syringe. It is said to be extremely accurate and fast and unlike most liquid filling machines this one will fill anything that can be brought to a fluid state by heat. Jacketed supply hoppers are provided when necessary. Change-over from one product to another takes 3 minutes. The filling heads are easily sterilized. This machine is indicated for filling vials, samples, ampoules, flacons and lipstick or suppository molds.

The Art Mahal

When I was in Los Angeles I visited Art Hanish's Art Mahal. Nobody in the trade but Art could afford to build this lacy, ethereal edifice. But then, nobody else has a private key to Fort Knox. The con-

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9. Fully enclosed feed mechanism minimizes dust.
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struction of the Art Mahal is the culmination of Art's boyhood dreams. Art always admired lace because in his day on a farm in Ioway all the girls wore lace drawers. Don't get me wrong. Art never actually saw any of those corn fed Ioway girls in lace drawers. He was too shy and anyway he couldn't afford it. But as he walked five miles to school every morning, he used to peek at the lace drawers hanging from the clothes lines behind every farm house on Monday mornings, and he resolved that if he ever got rich he'd surround himself with lace in some form. Hence the Art Mahal. Not everybody can buy himself a million bucks worth of stone lace. But memories are memories!

Invested Capital

The drug and cosmetic industries are living to some extent on capital invested by previous generations. I refer to the fact that these industries in the main are operating in buildings that are anywhere from 40 to 140 years old. Not only are these buildings inadequate for modern industry, but they create a false impression of production necessities because they are cheap. They are cheap as far as invested capital goes, but damned expensive to operate. Material handling, maintainence, cleaning, heating, cooling and supervision costs are enormous. These costs are hidden and are tolerated because we have no standard of comparison. Operating in outmoded, inadequate buildings, often poorly equipped, we have no opportunity to compare our costs with a standard of what they might be in new, properly designed and equipped buildings. In order to make such a comparison accurately, it is necessary to compare identical products made with identical equipment in identical production volumes. This can be done only when a company builds a branch plant of sufficient size to make its production runs comparable. As I said in my PMA speech in Los Angeles, most of the plants of our industry are junk and should be scrapped. There aren't above a baker's dozen first-class pharmaceutical and cosmetic factories in the whole of the United States. And it is a hell of a note that such a comment can be made without fear of refutation about the richest industry in the richest country in the world! In ten years we will be a *big* volume industry and we should begin preparing for it now.

Definitions

Compromise, says Voltaire, is the art of conceding to an adversary everything you don't want.

Voice of America

Everyone is urged to support the Voice of America even though we are not allowed to listen to it. Presumably it does some good. But I think we could spend our money more effectively by subsidizing visits to their home countries by immigrants who made good here. Let them go home and tell in their own idiom what American meant to them and what hope she holds for others.

Poet's Perception

For a long time it has been a hobby with me to argue that poets perceive truths long before these truths are discovered by scientists. Take Lucretius, the Roman poet, with his concept of "whirling atoms and whirling worlds"—centuries before scientists discovered that the world was not flat; that it did move; that matter was composed of moving atoms. Tennyson in 1847 saw the

> ". . . nations' airy navies
> Grappling in the central blue.
> From above there came a shouting
> And there rained a ghastly dew."

And he saw this as a prelude to the "parliament of man"—the United Nations. (We hope!)

Hence it gave me great pleasure to read the address, before the American Association for the Advancement of Science, of Dr. Chauncey D. Leake, author of "Perspectives in Virology" (John Wiley & Sons), in which he urged scientists to translate their work into terms ordinary people can understand. He suggested that art and poetry might be called upon to aid in communication and he wrote, as an example, what he called a "cadence." I would call it a first rate poem: Listen!

> "From all the vast
> unbounded sun-lit space about
> come fragments of an energy
> to catalyze our life,
> to make the green of plants,
> and in a mystic liturgy
> of ordered chance,
> to change another gene,
> which may produce,
> if viable, a kind
> of different living thing,
> which must, if it survives,
> adapt itself to others, as all
> of them shall find.
> Here in this systemed neat
> evolving scheme of everything,
> Time's Arrow points the way inflexibily
> nor can we shift a dot
> of its position, nor its movement stay,
> nor though we read
> the sign-post fairly well,
> to what it points, have we the wit to say."

Air Dryer for Small-Scale Requirements

The Pittsburgh Lectrodryer Division, McGraw-Edison Company, Pittsburgh 30, Penna., has announced a new Lectrodryer Budget Air Dryer for the many applications that require extremely dry air in small quantities—up to 20 cubic feet per minute. The unit is low-priced, costs little to operate and is described as ideal for instrument controls, wave

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Stainless Steel Filter Press

A new Terriss Filter Press is now available to the processing industries, for uninterrupted filtering operation, from Terriss Division, Consolidated Siphon Supply Company, Inc., 22 Wooster Street, New York City 13. Filter cake will not fall away from plates during operation, and the unit is designed to operate in a vertical position, with a worm gear for turning to horizontal position for cleaning and loading. Filter plates are 18″ x 18″ with stainless steel filter media supports and screen backing plates. Space can be specified for 1½, 2 or 3 inch cake; filtration surface from 15 to 100 square feet, with from 2 to 35 plates; capacity depends on type of liquid and number of plates used. The machine has heavy-duty ratchet sealing attachment, removable drip tray and precision ground surfaces to prevent leakage.

Automatic Liquid Rotary Vacuum Filler

Climax Products Division, Lodge & Shipley Company, 3055 Colerain Avenue, Cincinnati 25, Ohio, has announced a new automatic liquid rotary vacuum filler in the range of 4 ounces and smaller. The VF/8M is an eight-stem vacuum model designed for flexibility, economy and accuracy in filling a variety of container styles with liquids of varying viscosities at adjustable rates of 100 or more containers per minute. The filler has applications in the fields of chemicals, waxes, soaps, shampoos, hair tonics and the like. It is designed with relatively few moving parts, all of which can be removed and replaced without tools, which simplifies and speeds change-over. Bulletin VF-1 gives complete information.

New Open-End, Adjustable Racks

American Metal Products Company, 5959 Linsdale, Detroit 4, Mich., has developed a new line of open-end, adjustable racks, called Drive-In and Drive-Thru racks. From two to ten more pallets deep, they are designed to handle loads of practically any size, providing mass storage with a minimum of aisle space. Both ends of Drive-Thru racks are open for truck travel, and loads can be handled on a first-in, first-out basis. The Drive-In racks can be used against walls, or for truck entrance from either end. Opening heights are easily adjusted on four-inch centers.

Automatic Four-Flap Case Opener

Atkron, Inc., is producing an automatic four-flap case opener, Model CFO-1, under the firm's new trade name, Atkron Dumore. The case opener is designed to open all four flaps of cases and adjusts to handle sizes up to 14 inches wide, 21 inches long and 12½ inches deep, with maximum speeds above 30 cases per minute. The opener is powered by a main drive motor of ½ H.P. and all operations are automatic. The unit takes up floor space of 12 by 3 feet and fits all standard conveyor heights. Further information may be had from the Atkron Dumore distributors: Geo. J. Meyer Manufacturing Company, Box 452, Milwaukee, Wisconsin.

Narrow-Aisle Electric Truck

The Raymond Corporation, 141-173 Madison Avenue, Greene, New York, has made available a new, highly flexible adaptation of its four-dimensional version Reach-Fork truck. Capable of transporting and stacking 3000-lb. loads up to 16 feet wide in storage aisles no more than eight feet wide, the truck also tiers conventionally in six-foot aisles. It is spark-enclosed to permit operation in hazardous areas, and incorporates an auxiliary lift of 18 inches.

New Fork Truck Attachment

A fork truck attachment that stacks, transports and dumps barrels and drums is offered by Lewis-Shepard Products, Inc., 125 Walnut Street, Watertown 72, Mass. The attachment, the Drum Up-Ender, not only handles wooden barrels and steel or fibre drums through clamping pressure but also dumps their contents by hydraulic tilting pressure. Objects can vary from 18 to 26 inches in diameter and can be tilted up to 180° forward for dumping. All operations, clamping, rotating, lifting, lowering and tilting, are controlled from driving position.

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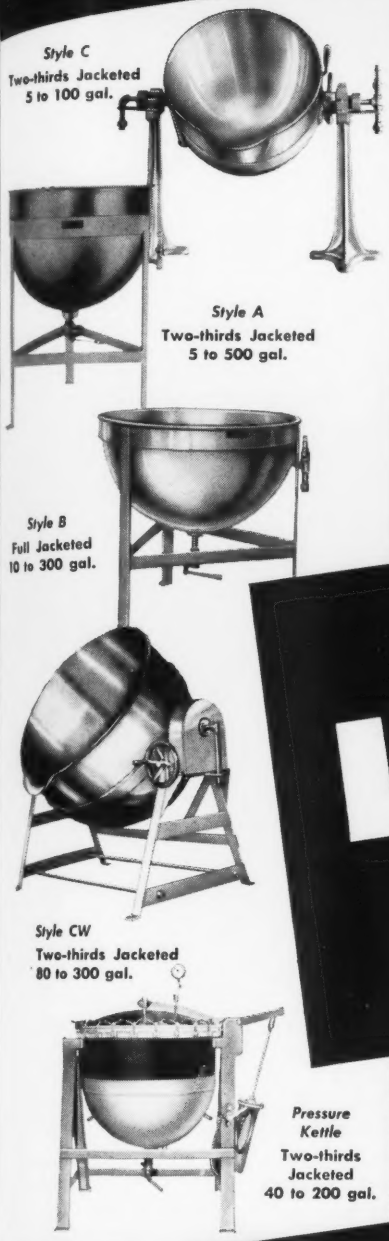

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Style A
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5 to 500 gal.

Style B
Full Jacketed
10 to 300 gal.

Style CW
Two-thirds Jacketed
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Pressure Kettle
Two-thirds Jacketed
40 to 200 gal.

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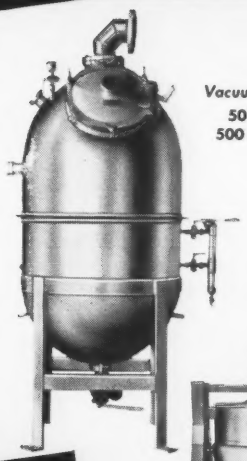
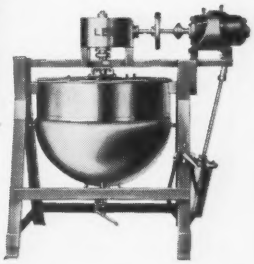
CW3T
Center-line Scraper Agitator Kettle
80 to 300 gal.



Vacuum Pan
50 to
500 gal.

D3T
Center-line Scraper Agitator Kettle
25 to 300 gal.



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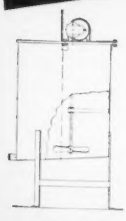
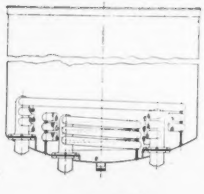
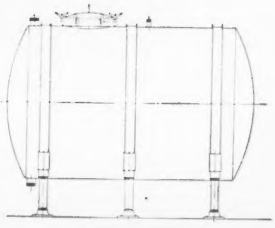


Mixing Tank
25 to 500 gal.



Pulp Tank
500 to 2,000 gal.



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Perfumer's Shelf

Honey and Sweetness

Why do all perfumers speak of the sweetness of the honey smell? Honey is only *sweet to taste*, because of its composition, which is an almost 50/50 balance of dextrose and levulose. Good clover honey is mild and sweet to taste but is smells rather like a "glue-pot" according to C. Farmiloe (*S.P.C.* 31: 973, 1958). It is nonsense to mix up this sweetness of *taste* with the almost acrid smell of phenylacetic acid, which is fairly characteristic of honeys in general. Honey which has slightly fermented smells sweeter, because it has become vinous and fruity. It is purely incidental that many smells in nature are sweet. There are probably considerably more that are not sweet. For example, while the flowers of the Common Arabis smell faintly in a warm spring morning of methyl salicylate, mixed perhaps with benzyl acetate, the leaves have an abominable odor—a little like nasturtium and a little like the odor of the dimethyl acetal of hydratropic aldehyde. Many nectars from flowers and the honeys derived from them are not only poisonous to man but, as in the of Noves honey from Africa, quite unpalatable, producing an appallingly scorching feeling on the palate when tasted.

Geranium oil

Geranium oil is not only important as a source of rhodinal, a basic fragrance material, but in other applications such as perfuming of soaps, cosmetics and cold stirred perfumery specialties. The rose character of geranium oil endows perfume compositions with the popular rose note. Geranium oil can readily be formulated with hydroxycitronellal, lavender oils, and oils of neroli, palmarosa, ylang-ylang, cananga, citronella, and others. Geranium oil may be derived from 400 to 600 different members of the pelargonium family. These grow between 44 degrees northern and 30 degrees southern latitude, in Egypt, Algiers, France, Italy, Belgian Congo, Corsica, Madagascar, Morocco, Tanganyika, Reunion, Spain, Syria, and the U.S.S.R. The total crop amounts to about 130 metric tons. Lothar v. Jaminet; *Riechstoffe und Aromen*, 233, 1958.

Essential Oil Antioxidants

The development of off-odors and flavors, and darkening is the result of oxidation to form products such as aldehydes, ketones, and acids. It is a reaction that occurs spontaneously when unsaturated oils are exposed to the air, the rate at which it develops varying according to the conditions of exposure. Storage of the oil at a reduced temperature is sometimes employed to prolong its storage life. Very often, however, the maintenance of a low temperature is neither possible nor convenient and hence the addition of certain organic inhibitors, or antioxidants, will provide an easy and valuable means of preserving their original condition. Antioxidants though present in only very small concentrations, have the property of inhibiting the series of reactions which bring about the alteration of odor and flavor. The existence of naturally occurring substances that delay oxidation has been known for quite some time. It had been observed even over one hundred years ago that lard with vanillin added to it did not become rancid as quickly as untreated lard. The most important of the naturally occurring antioxidants are the tocopherols, which are found particularly in vegetable oils. Groundnut oil has been employed as a useful source for the concentrates of these antioxidants. A number of antioxidants have been developed which have gained official approval in many countries of the world for use in oils and fats. In Great Britain the use of food grade antioxidants has come to be particularly important as the U.K. Antioxidant in Food Regulations came into operation only last September. These regulations include permission to use butylated hydroxyanisole, butylated hydroxytoluene, *n*-propyl gallate, *n*-octyl gallate, and *n*-dodecyl gallate.

Many essential oils contain small amounts of heavy metals such as iron and copper; fennel oil, for example, can contain up to 0.001 per cent of iron. These metal traces may greatly reduce the protective effect of an added antioxidant and may also cause the production of yellow or red discolorations unless they are first deactivated. Certain organic acids such as citric acid are used to remove interference due to trace metal ions, with the result that the storage life of the oil is often further improved. This sequestering action of citric acid, coupled with its complete freedom from toxicity, accounts for its frequent inclusion in antioxidant formulations. Experimental data indicates that the optimum amount of antioxidant required to inhibit the development of "off-flavors" in essential oils for flavoring purposes and citrus oils is 0.1 per cent. This quantity is now permitted not only in essential oils, but also in their derivatives and constituents used for flavoring purposes. Smaller concentrations than the permitted maximum are, however, often sufficient and as an example, with 0.01 per cent of B.H.A. and 0.01 per cent of citric acid in fennel oil, a Protection Factor of 5 is commonly obtained. Citric acid is normally used in conjunction with B.H.A., or B.H.A. and propyl gallate, in concentrations up to 0.05 per cent. It is important that the antioxidant is added as early as possible; it will not restore freshness to an oil that

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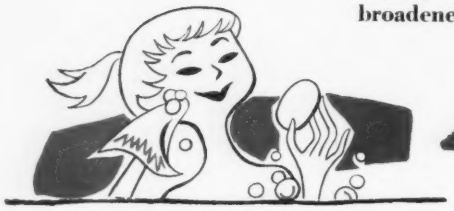

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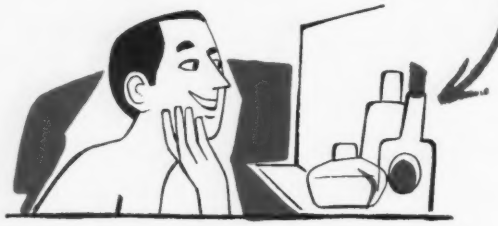

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has already started to deteriorate. For this reason addition is best made immediately after manufacture, or sometimes even during manufacture, of the oil. The concentration of antioxidant required varies from 0.001 to 0.1 per cent. The chief factors governing the concentration used are the original state of the oil, how soon after manufacture the antioxidant is introduced, and how long it is desired to extend the storage life.

Butylated hydroxyanisole is easily soluble in essential and citrus oils at room temperature and may be incorporated simply by direct addition and thorough stirring. It is sometimes convenient and assists dispersion if a concentrated solution of B.H.A. in a part of the oil is made and blended with the remainder of the oil by stirring.
—*Chemical Products*, 21: 438, 1958

Perfuming Cosmetics

Vanishing or foundation creams are emulsified products which have to be massaged into the skin. The perfume should cause no skin irritation, and none of the ingredients should make the cream darken or discolor. The perfume content should be just sufficient to impart a pleasant perfumed note on application. This is an instance where it is advantageous to make a careful choice of the quality of the raw materials. A cream which has no unpleasant basic odor will not require a pungent odor to mask the impurities and can easily be perfumed with a low percentage of a good quality perfume. This will not only make for economy in manufacture but will lessen the chance of discoloration of the cream or irritation of the skin.

Face powder compounds should be prepared in the same way as a handkerchief perfume. They can contain the high boiling essential oils and synthetics, with resinoides and other ingredients used as fixatives. The compound should not tend to discolor or darken the powder base. Because face powder is used frequently with the replacing of makeup and is often the only perfume being worn, it is desirable to use a good quality perfume. The easiest method of incorporating perfume into the powder in the absence of a spraying machine is first to prepare a concentrated powder and then to mix the correct percentage of this concentrate with the bulk. It is always desirable to sieve the powder to ensure even distribution of the ingredients and to remove all undesirable "bits and pieces."

Lipsticks are perfumed or flavored, and should not contain any product with a bitter flavor. Since many compounds or bouquet compounds do not have appeal in an edible form, the variety of odors is rather limited. The floral types used in confectionery, such as rose and to a limited extent violet, could be safely used. The spicy notes have a certain appeal and sometimes a compromise is reached between the floral complexes and the millefleurs type. The fruit flavors, such as raspberry and strawberry have often been tried but not found very popular.

Shampoos are easier to perfume than most toilet preparations and the modern shampoo allows the use of most aromatics. Only sufficient perfume is required to cover the basic odor of the shampoo and to impart a pleasant residual odor to the hair after shampooing.

Toilet soap perfuming is quite distinct from the technique employed in preparing and perfuming other toilet products. The floral complexes are much more popular in soap than they are in other preparation. One important reason for this is because the ingredients generally used in preparing a floral compound for soap are generally more trouble-free than those which would have to be used in a complicated bouquet compound. The compound should be very stable in soap and cause the minimum discoloration.
—W. C. Botfield—*Pharmaceutical Journ.*

Vetiver Oil

Four types of vetiver oil are recognized commercially: 1. Oils distilled in Europe or North America from roots imported from Java; of excellent quality. 2. Oils distilled in Java; good quality. 3. Oils distilled on Reunion island; usually excellent in quality. 4. Oils distilled in Haiti or, to a small extent, in Mexico, Central America (Guatemala and Honduras) and South America (Sao Paulo in Brazil); a somewhat different type than the others.

The chemistry of vetiver oil is still imperfectly known. The Java oil consists of a mixture of sesquiterpenic ketones (15-27 per cent) and sesquiterpenic alcohols, bicyclic, tricyclic, primary and tertiary (45-65 per cent). The ketonic portion seems to be a mixture of two ketones known as alpha- and beta-vetivone. The alpha form has a sweet, agreeable, powerful odor characteristic of vetiver oil, while the beta form has a relatively faint odor reminiscent of styrax. The alcoholic portion of the oil is a complex mixture of isomeric alcohols which has not been completely resolved in spite of the considerable work which has been done on the subject by numerous investigators. This mixture is known, collectively, as vetiverol or vetivenol, and has the sweet fragrance of vetiver without the occasional roughness and grassy note of the natural oil. Acetylation of the alcohol mixture yields vetiveryl acetate, which still retains the vetiver character although it is slightly milder and has a fresh, dry character.

Vetiver oil and its derivatives are among the most valuable in the perfumer's repertoire. They are indispensable in odors of the heavier oriental type and even in the better florals. They constitute natural fixatives *par excellence*. Because of their strength they must be used with care and discretion, since an overdose may result in a pronounced woody note. They blend well with sandalwood, patchouly and rose.
—M. S. Carpenter, *The Givaudanian*

Menthene Alcohols

U. S. Patent 2,851,481 issued to R. L. Webb and assigned to the Glidden Company, describes an ingenious method of producing mentheme and menthene alcohols from terpene hydrocarbons rich in 2,4(8)-p-menthadiene. The menthadiene is obtained in the acid isomerization of turpentine, pinene and as a by-product in camphene production. The partially purified menthadiene is treated with hydrochloric acid to give a monohydrochloride. The hydrochloride is then hydrolyzed with an aqueous base to yield a mixture of hydrocarbons for reprocessing and the menthene alcohols 3-p-menthene-8-ol, 3-p-menthene-2-ol or carvenol and 4(8)-p-menthene-3-ol or pulegol. Treatment of 3-p-menthene-8-ol with formic acid causes allylic rearrangement to pulegol which may then be reduced to menthol.

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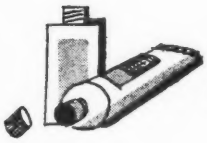

Advancing Therapy

Antifungal Griseofulvin

The systemic treatment of superficial fungus infections in man at last seems a near reality. Gentles' recent report of the successful oral treatment of Trichophyton and Microsporum infections in guinea pigs with griseofulvin, a product of several penicillia, was a great step forward. Subsequently, Lauder and O'Sullivan found it effective by mouth in calves with Trichophyton verrucosum infections. This paper by H. Blank and F. J. Roth, Jr. (*A.M.A. Arch. Dermatol.* 79:259, 1959) is a preliminary report of observations on the effectiveness of oral griseofulvin therapy in man. The antibiotic was supplied by Glexo Laboratories, England.

Griseofulvin is a colorless, neutral, thermostable antibiotic isolated from Penicillium griseofulvin in 1939. In a series of publications, the chemical structure of the substance was established and its activity against a number of fungi reported. Griseofulvin appeared to be most useful against infections in plants, in which it also shows systemic antifungal activity.

Mycoses caused by various species of dermatophytes show a uniformly favorable response to oral therapy with griseofulvin.

Infections of long duration, up to 60 years, seem to respond as readily as those patients indicated excretion by this route.

Infections caused by Candida albicans, Malassezia furfur, and Blastomycosis dermatitidis do not seem to respond to this therapy.

Tinea corporis is usually cleared in one to two weeks; itching usually ceases in three to five days.

Tinea pedis is improved in one to two weeks but may require three to four weeks or longer to clear.

Tinea capitis improves in two to three weeks but may require more prolonged treatment.

Onychomycosis requires three to four months to clear, but new normal nail growth is seen earlier.

Cultures of epithelial lesions often become negative in one week. Direct KOH examinations may be positive for an additional week or more.

Infected nails and hair appear to contain viable fungi until the involved portions are replaced by healthy new growth.

Although toxic reactions appear to be minimal in therapeutic doses in man, the animal data indicate that repeated peripheral blood cell counts at least should be performed during a course of prolonged therapy.

One patient developed an urticaria-like drug erruption after six weeks of continuous therapy, and others have had mild self-limited complaints of gastrointestinal distress and headache.

A daily dose of 1.0 gm. seems to be adequate, although the minimum effective dose and the optimum dose have not been established for all types of infection.

The duration of treatment required probably will vary, apparently depending on the time required for normal replacement of the infected tissues.

Analgesic Mixture

A hypnotic composition containing one to three parts of acetophenetidine and three to one parts of salicylamide has been patented by Frank M. Berger, U. S. Patent 2,872,370, and assigned to Carter Products, Inc. It was found, in animal tests, that salicylamide or acetophenetidin alone did not produce sleep, but a mixture of 280 mg. of salicylamide and 420 mg. of acetophenetidine caused all of the mice to sleep. The following drugs, when mixed with salicylamide have some degree of sleep-producing effectiveness: acetanilide, aminopyrine, phenetsal, phenetidine, p-aminophenol, p-acetominophenol. Only benzamide was effective in place of salicylamide when mixed with acetophenetidin. No clinical data on human beings are given in the patent. The first claim is for "a sleep-producing composition substantially free of stimulating agents containing as the active ingredients acetophenetidin in an amount of about one to about three parts by weight and salicylamide in an amount of about three to about one part by weight."

Trimeglamide Sedative

In the course of an investigation of new compounds with action on the central nervous system by G. Cronheim, J. T. Gourzis and I. M. Tockes (*Science* 128:1570, 1958) trimethoxybenzoyl - glycine - diethylamide (Riker 548; proposed generic name, trimeglamide) demonstrated the ability to induce in animals a state of somnolence which could not be distinguished from the physiologic state of sleep. This somnifacient action was neither preceded nor followed by skeletal muscle involvements. No other drug known will produce this phenomenon.

In man, single or repeated oral doses of 500 to 1500 mg. caused sedation or drowsiness, or both, without any side effects in about half of over 200 patients thus tested. Oettinger has described the effect of trimeglamide on eloctroencephalographic recordings. The administration of 2 to 8 mg./kg. to 51 children or adults produced in the majority of patients a feeling of relaxation and pleasant tiredness. Electroencephalographic

recordings showed neither spindling nor any drug-induced artifacts and no changes in alpha frequency or alpha index.

The lack of hypnosis or anesthesia and of undesirable side effects or artifacts is a distinct advantage for a sleep-inducing drug. In the case of trimeglamide, this advantage is of particular interest since the acute toxicity is vry low. Dogs, cats, and mice have tolerated single oral doses of 500, 770, and 2000 mg./kg., respectively. Chronic administration to dogs (35 mg./kg. day for 9 months and rats (100 mg./kg. day for 6 months) did not produce signs of drug toxicity during the test or on histopathological examination.

Ferrous Fumarate

Ferrous fumarate is an iron complex with the empirical formula $FeC_4H_2O_4$ available as Toleron from Mallinckrodt. It is a stable reddish-brown, microcrystalline powder with essentially no taste. The iron content of ferrous fumarate is higher than that of other medicinal iron salts, being 33 per cent as compared with 20 per cent in ferrous sulfate, 31 per cent in desiccated ferrous sulfate and 12 per cent in ferrous gloconate. Nevertheless, pharmacologic studies and early clinical impressions have suggested that it may be better tolerated than these other iron compounds.

Investigation involving the use of radioactive iron has shown that ferrous fumarate is absorbed quickly and efficiently. Preliminary clinical studies with anemic patients have shown that the hematologic response in iron deficiency is rapid and complete.

The present study by J. B. Shapleigh and A. Montgomery (*Amer. Pract.* 10:461, 1959) was made in order to evaluate the potential advantages of ferrous fumarate in routine clinical cases. A number of patients with iron deficiency anemia or other conditions in which iron therapy seemed warranted were treated with the drug at various dosage levels. A critical appraisal of gastrointestinal symptoms was made during the course of treatment.

In all, 21 patients were studied. They were not informed of the nature of the drug except that in some instances they were told that it contained iron. Most of the patients were truly iron-deficient.

In the patients having uncomplicated iron deficiency, the therapeutic response to ferrous fumarate was excellent. The duration of therapy was variable, but in no case was it less than two weeks—certainly a long enough time for any side effects to become manifest.

Of the 21 patients treated, 18 experienced no gastrointestinal or other undersirable side effects. Two patients had mild gastro-intestinal symptoms which did not require discontinuing the drug. One patient was intolerant to all oral iron preparations tried.

From the evidence at hand, it can be stated that ferrous fumarate is an effective therapeutic agent for treating iron deficiency, and it appears to be well tolerated from the standpoint of gastro-intestinal side effects.

Treating Mongolism

J. D. Moragas (*Rev. espan. pediat.* 14:545, 1958) has used dehydroepiandrosterone (DEA) in treating 61 out of a series of 163 children with mongolism during the last 5 years. The initial treatment consisted of two periods of intramuscular injections. The subsequent maintenance treatment consisted of alternating 10-day periods of medication and rest. The earlier the treatment is started, the better the results. In the group of patients treated by the author, 38 were infants less than 2 months old and 23 children were over 3 years of age when the treatment was started. Thirty-two infants who reached the age of 2 years in the course of the treatment were able to walk at an average age of 19 months, in comparison to ages of 2 or 3 years for walking in infants who had no treatment. The mongoloid features became greatly attenuated in 32 infants, 30 of whom exhibited improved facial expression, good response to stimulation, and a syntonic personality. The benefits obtained from the treatment in the older children were not as remarkable as they were in the infants. All the patients became more teachable.

The author concludes that the drug is the most effective one yet found for mongolism. It is well tolerated and it can be given to ambulant patients. It has no effect on the development of talking. The treatment does not transform the mongoloid into a normal child, but it greatly improves the somatic and mental conditions of the patients, makes the mongoloid features less noticeable, and favors permanent adaptation of the patient to social and familial relations.

Ascorbic Acid in Skin

Ascorbic acid determinations were done by J. O. Priestley and R. C. Foster (*J. Invest. Dermatol.* 32: 1, 1959) in 10 specimens of normal skin obtained from surgical amputations. All determinations were done within twenty-four hours after surgery. Subcutaneous tissue was removed from the corium by dissection, and the epidermis was separated from the corium by the Van Scott stretch method. The amount of ascorbic acid found in the 10 specimens of normal epidermis varied from 5.41 to 13.40 mg. per 100 gm. wet weight, and all specimens consistently showed much more ascorbic acid in the epidermis than in the corium.

Cothera Compound (Ayerst) is a palatable syrup for the treatment of coughs containing in each 5 cc. teaspoonful 25 mg. of dimethoxanate hydrochloride antitussive, 2 mg. of isothipendyl hydrochloride antihistaminic, 5 mg. of levo phenylephrine hydrochloride vasoconstrictor, 100 mg. of acetaminophen analgesic, 100 mg. of ammonium chloride and 50 mg. of sodium citrate expectorants, 0.25 per cent of chloroform and 10 per cent of alcohol. The product is available in one pint and one gallon bottles.

Triburon (Roche) is a broad spectrum topical microbicide, not an antibiotic, which is non-sensitizing and non-irritating. Microorganisms do not seem to develop resistance to the compound which chemically is N,N'-bis [-methyl-3-(2,2,6-trimethyl cyclohexyl) propyl]-N,N'-dimethyl-1,6-hexanediamine bis methochloride. The ointment, in one ounce tubes and one pound jars, contains 0.1 per cent of Triburon; the HC ointment, in 5 gram and 20 gram tubes, contains 0.1 per cent of Triburon and 0.5 per cent of hydrocortisone.

Neptazane (Lederle) is intended for the treatment of acute and chronic glaucoma. Each tablet contains 50 mg. of methazolamide carbonic anhydrase inhibitor and the preparation is available in bottles of 100.

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Skin Research

Skin Pharmacology

R. Kooij (*Dermatologica* 117: 482, 1958) surveyed the literature pertaining to the pharmacology of the skin for 1957 and 1958.

Kleine-Natrop showed that vaselin and eucerin cum aqua cause an increase of the skin temperature, proportional to the thickness of the ointment layer. Thin layers of ung. lanette had a short but intensive cooling effect while the cooling effect with thick layers was less intensive but lasted longer. *v. Czetsch-Lindenwald* reported on new ointment bases. *Hermann* found that with Kerodex 71 and W/O base with 50 per cent silicone oil orthoergic skin diseases could be prevented. He also carried out a comparative investigation on the activity of barrier creams with and without silicone oil. It appeared that barrier creams containing silicone oil had no advantage over those available up to now. *Schulze, Reiff* worked out a method to determine the amount of salicylic acid deposited in the skin at the site where the salicylic acid in castor oil was applied. *Jadassohn* et al. investigated the influence of certain excipients (petrolatum, hog's lard, polyethyleneglycol [Carbowax], lanolin, emulsion O/W on the percutaneous resportion of potassium iodide and of an iodide organic compound (Iothion) by measuring the iodine excreted in the urine. With Iothion best resorption was obtained using petrolatum and then came the emulsion O/W, lanolin, hog's lard, and polyethyleneglycol.

Ruhrmann, Schulten injected various amounts of testosterone esters in 19 males. It was shown that relation existed between the dose of testosterone and the excretion of 17 ketosteroids in the urine but no influence was detectable on the lipids of the skin. *Shelley, Hurley* showed that androgens and estrogens, implanted in the axilla in pellet form for periods up to five months, failed to produce demonstrable change in the axillary skin or its appendages. They conclude that androgens and estrogens have no direct local effect on normal adult human skin. *Schaaf, Gross* demonstrated that pregnenolone and their acetic acid, propionic acid and myristic acid esters, which have no specific activity on the sex organs, evoked in an ointment-like emulsion the same changes in the skin of guinea pigs as the estrogens do. *Jensen, Reymann* prepared a tar-containing hydrocortisone cream. With the use of such a tar-containing "vanishing cream" the cosmetic drawbacks of the ordinary tar ointments are eliminated, but clinical studies revealed that tar had a substantially reduced therapeutic effect when used in the O/W emulsion. Besides, the O/W emulsion produced irritation in several patients although precautions were taken to avoid this occurrence. *Smith* found that more soluble forms of hydrocortisone were no more effective topically than either hydrocortisone (free alcohol) or hydrocortisone acetate.

Hydrocortisone diethylamino-acetate hydrochloride ointment (½ per cent) was slightly less effective than hydrocortisone (free alcohol) ointment (1 per cent) and hydrocortisone hemisuccinate sodium ointment (½ per cent) was not as effective as hydrocortisone acetate ointment (1 per cent). Hydrocortisone diethylaminoacetate hydrochloride ointment (½ per cent) probably was more effective than hydrocortisone hemisuccinate sodium ointment (½ per cent).

Goldman et al. studied the local action of corticosteroids at cellular level in the skin of man with the aid of paper chromatography. In this way the persistence in tissue of the corticosteroids, especially after local injection, was confirmed. A number of non-identified steroids were found. *Goldman* et al. reported that soluble prednisolone hemisuccinate, although highly effective intravenously in severe dermatologic reactions, was ineffective when injected locally to inhibit inflammation.

Rajka studied the influence of hydrocortisone and antihistaminics applied locally on nicotinic-acid erythema. Only hydrocortisone ointment had any visible effect. *Halter, Shafer* showed that application of hydrocortisone ointment in adrenalectomized rats increased the surviving time of the animals. *Malkinson* et al. demonstrated percutaneous absorption through normal human skin by detection of radioactivity in the urine following topical application of cortisone-4-C^{14} acetate incorporated into an ointment base. Penetration of cortisone and hydrocortisone into the skin and closely similar, qualitatively and quantitatively. The inefficacy of topical cortisone therapy, in contrast to hydrocortisone therefore implies formation in the skin of one or more potent anti-inflammatory metabolites specific for hydrocortisone.

Morgard showed with Ni^{57}, Co^{56} and Na^{22} as indicators that when these substances are applied to the skin of rabbits and guinea pigs, they can be demonstrated in the blood. In the case of nickel in 24 hours and

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in the case of cobalt and sodium in one hour. Cobalt and sodium applied to human skin are not resorbed. *Tas, Feige* tested the ability of radioactive iodide (I^{131}) to penetrate the skin with a patch test technique. About 2 per cent of the I^{131} applied to the forearm passed the skin barrier and was detected in the thyroid and the urine. Penetration of radioactive iodide through the palmar skin was also demonstrated, being about a third of the penetration through the skin of the forearm. Radio-iodide simply dropped on the skin and allowed to dry penetrated in traces. *Ippen, Betzler* determined the thickness of ointment layers on the skin by measuring the added radioactivity of iodine (I^{131}). The method is of special interest to protective ointments against light, in which the thickness is of great importance. *Borelli, Metzger* revealed by fluorescence-microscopy on pigs- and human skin the transepidermal and transfollicular penetration of fluorochrome containing skin medicaments. *Monash* found that the superficial barrier to percutaneous penetration of the substances studied (Xylocaine-, pyribenzamine-, and pontocaine compounds) is formed by practically the entire thickness of the stratum corneum. The greater part of this barrier is formed by the outer half to two-thirds of the stratum corneum. *Brun, Bujara, Jadassohn* applied saturated and unsaturated fatty acids (with one double bond) and alcohols with chains of different lengths to the skin of the flank of guinea pigs. The resulting acanthosis was measured and was found to be dependent on the length of the chain. It varied according to whether acids or alcohols, and whether saturated or unsaturated, bonds were used. *Schaaf* examined the acanthotic factor of crude coal tar as well as fractions of this tar. With crude tar, the neutral fraction boiling below 250° (15 mm.) resulted in a clear, though not very important acanthosis. Acid and alkaline components were shown to be inactive. Among the hydrocarbons submitted to the same test. pyrene (5 per cent) alone produced important epidermis thickening.

Steffen et al. evaluated various antihistaminics as local anesthetic agents. It was concluded that a 1 per cent solution of Pyribenzamine, Benadryl, Neo-antergan and Chlor-trimetron would be satisfactory and safe substitute for procaine in patients who are either allergic to procaine or who obtain little or no anesthesia from procaine. Pyribenzamine produced satisfactory anesthesia in every case and would be the drug of choice for further investigation. *Monash* produced topical anesthesia of the unbroken skin in from 45 minutes to one hour by application of 2 per cent anesthetic base solutions in an alcoholic solvent under an occlusive dressing. Similar anesthesia could be produced in one-half hours with 5 per cent anesthetic bases in hydrophilic ointment or petrolatum.

Freimuth et al. showed that boric acid, in 5 per cent solution, is readily absorbed through rabbit skin, whereas boric acid in talc, as well as in the form of calcium metaborate (5 per cent slurry in water) yields little or no absorption. An increase in pH, established with NH_3-$(NH_4)_2CO_3$ buffer at pH 9.0 results in less absorption of boric acid from aqueous solution than is the case with boric acid in water alone. *Fisher, Freimuth* studied blood boron levels in human infants. 37 patients exposed to boron-containing medications as well as dietary boron, showed an average blood boron concentration of 0.20 microgram per milliliter and a high of 1.25 micrograms per milliliter. Two children who accidentally received a boric acid solution orally showed blood boric acid levels of 7.89 milligrams per cent and 7.44 milligrams per cent respectively. Neither of these patients exhibited any signs of boric acid toxicity despite the fact that these levels are above those previously reported as fatal.

Blank et al. showed that the rate penetration of the anticholinesterase agent sarin, through a confined area of excised human skin is independent of the amount applied, as long as the entire area is covered with a reserve amount of sarin. By means of successive stripping, it was found that the major barrier against penetration is near the base of the cornified epithelium. The penetration appears to be primarily transepidermal. In-activeness of the barrier is important in limiting the penetration of sarin through the living skin. *Frederiksson* carried out a detailed study on the percutaneous absorption of sarin and two allied organic phosphorus cholesterinase inhibitors.

Blohm found that the skin irritating and protein-denaturing effects of a homologous series of alkyl sulfates (C8—C16) are closely correlated. By means of a special dye method, it is demonstrated that sodium dodecyl sulfate is fixed to the skin in a manner which renders rinsing with water incapable of removing it.

Rostenberg, Gonzales showed that the topical application of malonate ions had a definite inhibitory effect on eccrine sweating. It is assumed that this is achieved by competitive inhibition of the enzyme succinic acid dehydrogenase. *Williams, Pinkus* found no significant increase in the measurements of sulfate in profuse sweat after the oral ingestion of elemental sulfur precipitate. *Skog* exposed guinea pig skin to selenium disulfide shampoo and to shampoo without selenium, the volume of the sebaceous glands being determined before and after treatment. While both shampoos considerably increased the volume of the sabaceous glands, the effect of the selenium disulfide shampoo was more pronounced. *Schulz, Rose* found that in the same concentration alkylsulfates provoked more erythematous and vesiculous reaction than sodium soaps. *Scott* reported that chymotrypsin may be used in concentrations of 0.1 per cent in Ringer's solution as a dependable means of achieving dermoepidermal separation without destruction of either fragment. The protective action of hydrocortisone against the effect of chymotrypsin on skin in vitro appears to be asserted through its ability to decrease conective tissue ground substance permeability.

Hambrick showed that the effect of substituted naphthalenes on the pilosebaceous apparatus of rabbit and man consists of stimulation of the epithelium of the outer root sheath and sebaceous gland ducts and a diminution of sebaceous gland tissue to a striking degree. Administration of vitamin A in high dosage to man or rabbit preceding topical application of highly chlorinated naphthalene did not result in any amelioration of the effect. In the rabbit, testosterone did not result in any accentuation of follicular hyperkeratosis or lessening of sebaceous gland diminution. Likewise, estrogen and cortisone failed to influence the reaction pattern.

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Catalysis Volume VI, *Edited by Paul H. Emmett, Professor of Chemistry, The Johns Hopkins University, 706 pp., Reinhold Publishing Corp., New York, (1958), cloth,* **$19.50.**

The first two volumes of this series cover all the general approaches and tools used to gain a better understanding of both homogeneous and heterogeneous catalysis. Volume 3 summarizes existing knowledge on the subjects of hydrogenation and dehydrogenation, and Volume 4 is devoted entirely to the Fisher-Tropsch synthesis. Volume 5 includes hydrogenation, oxosynthesis, hydrocracking, hydrodesulfurization, hydrogen isotope exchange and related catalytic reactions. This sixth volume covers catalytic cracking, isomerization of hydrocarbons, polymerization, polymerization of olefins, alkylation and hydroreforming. A final volume is now in preparation.

New and Nonofficial Drugs, *1959, 687 pp., J. B. Lippincott Co., Phila., cloth,* **$3.35.**

This contains descriptions of therapeutic, prophylactic and diagnostic agents evaluated by the Council on drugs of the American Medical Association. It is an annual publication issued under the direction and supervision of the council. The function of the Council on Drugs is to examine and evaluate available evidence relating to the actions, uses, dosage, hazards and other pertinent properties of drugs and to encourage rational therapy by timely, informative reports to the medical profession. Approximately 41 monographs have been added for drugs evaluated since the previous edition of N.N.D Twelve monographs appearing in the previous edition have been omitted.

Chemistry Made Easy, *by Cornelia T. Snell, Ph.D., and Foster Dee Snell, Ph.D., 262 pp., Chemical Publishing Co., Inc., New York, (1959), cloth,* **$10.**

This work covers the three main branches of chemistry: general, inorganic, and organic. Accordingly, the book is divided into three parts. Each part includes over 20 chapters containing general information, tables, illustrations, and chemical equations which will give the reader or student a good all-around picture of chemistry.

Treatment In Internal Medicine, *by Harold Thomas Hyman, M.D., Monmouth Memorial Hospital, 609 pp., J. B. Lippincott Co., Phila., (1958), cloth,* **$12.50.**

This is an authoritative compendium of current treatment procedures and is outstanding for its explicit presentation of technical knowledge and its combination of wisdom and common sense. Organized in ten sections: The infectious Diseases—Metabolic Disturbances—Neoplasms—Allergies, Collagen Disorders, Hypersensitivities, Idiosyncrasies and Untoward Reactions — Poisonings and Environmental Hazards—Disturbances of the Circulatory System—Disturbances of the Blood and Blood-Forming Organs—Neuropsychiatric Disturbances—Disturbances of the Endocrine Glands—Disturbances in Specialty Fields.

Trifluoperazine, Clinical And Pharmacological Aspects, Twenty-five Original Reports with an Introduction *by Henry Brill, M.D., Assistant Commissioner, New York State Department of Mental Hygiene, 219 pp., Lea & Febiger, Phila., (1958), cloth,* **$3.50.**

Trifluoperazine is an important new drug that is proving very effective in treating a wide variety of psychotic and neurotic disorders. This book contains 23 clinical papers on trifluoperazine and two reports describing pharmacologic and toxicity studies. The papers presented are grouped under 5 main headings. Psychopharmacology, Pharmacology and Chemistry — Functional Psychoses — Brain Disorders — Psychoneuroses and Personality Disorders—Extrapyramidal Symptoms and Other Side Effects.

Pharmacology And Therapeutics, *by Arthur Grollman, Ph.D., The Southwestern Medical School, University of Texas, 1034 pp., 3rd Ed. Illus., Lea & Febiger, Phila., (1958), cloth,* **$12.50.**

Practitioners and students who want a sound foundation for the rational and scientific use of drugs will find it in this well organized presentation.

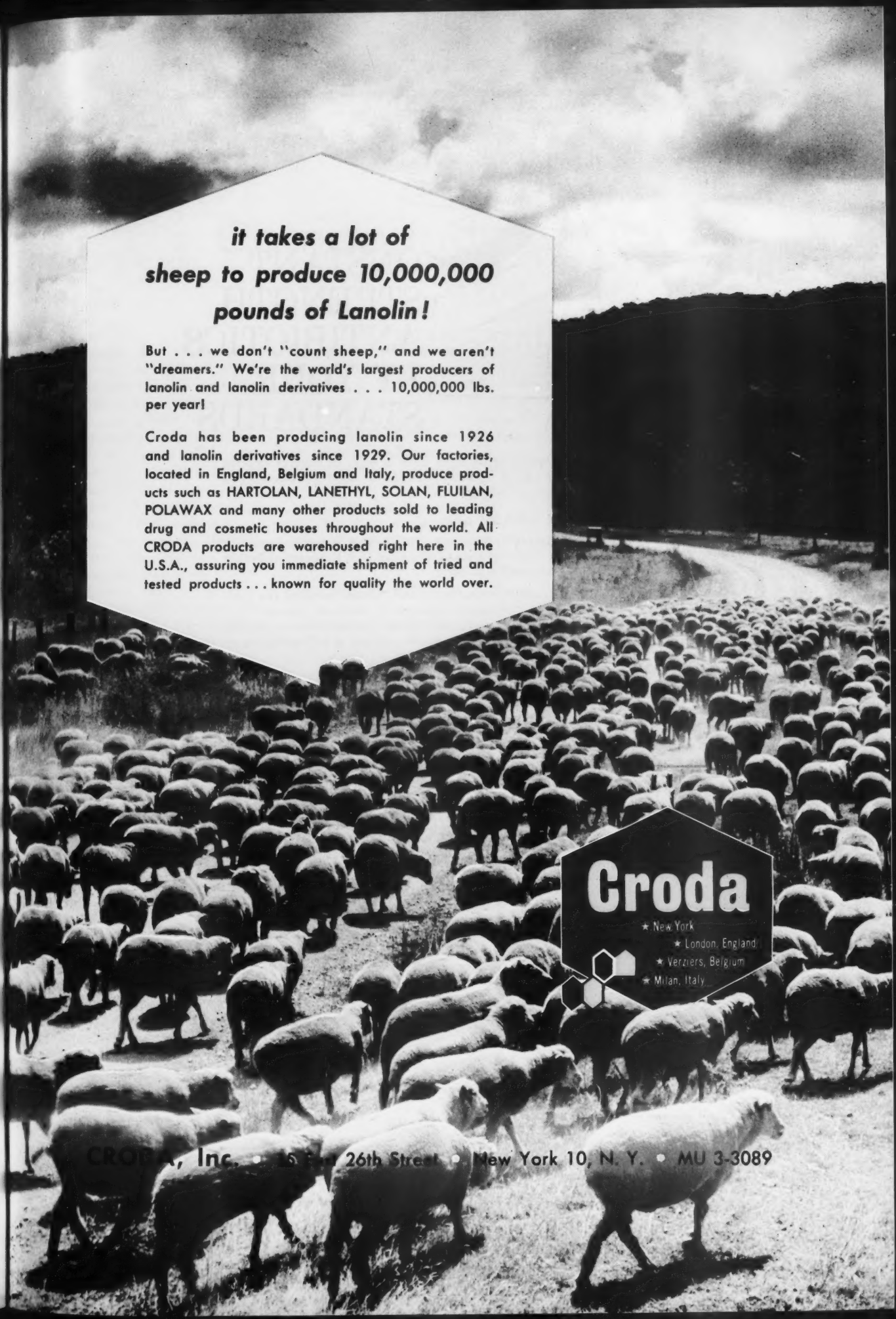
Features of the 3rd Ed. include—Describes and tells how to use every new drug that has received official recognition. Twelve new chapters cover the tranquilizing drugs, drugs acting on the autonomic ganglia, drug therapy of cancer, and every pharmacologic and therapeutic topic which has assumed importance in recent years. Detailed consideration of newly introduced antibiotics. Subject completely rearranged and fully integrated for greater teaching and reference value. Text now divided into sections according to organ symptoms. 65 new, original illustrations for a total of 192.

The Tobe Lectures In Retail Distribution At The Harvard Business School, *Second Series (1957-1958), 168 pp., Harvard University Graduate School of Business Administration, Boston, cloth,* **$3.**

This volume presents the addresses which were delivered in the second annual series of Tobe Lectures in Retail Distribution at the Harvard Business School. The group of speakers from a wide range of businesses include: B. Earl Puckett, Chairman of the Board and Chief Executive Officer of Allied Stores Corp., Joseph B. Hall, President of The Kroger Co., Paul Mazur, Partner in Lehman Brothers; L. L. Colbert, President, and Virgil Exner, Vice President and Director of Styling, Chrysler Corp.; David L. Yunich, President of L. Bamberger & Co., A. W. Hughes, President of the J. C. Penny Company, Inc.,; Pierre Martineau, Director of Research and Marketing, Chicago Tribune; and Richard C. Bond, President of John Wanamaker, Phila.

Occupational Allergy, *329 pp., Charles C. Thomas — Publisher, Springfield, Ill., (1958), cloth,* **$10.**

This is a series of lectures given during a course on occupational allergy at the Hague in May, 1958, which was organized by the Netherlands Society of Allergy in co-operation with the Netherlands Institute for Preventive Medicine and the Netherlands Society of Occupational Medicine under the auspices of the European Academy of Allergy. This work fulfills a long-felt need.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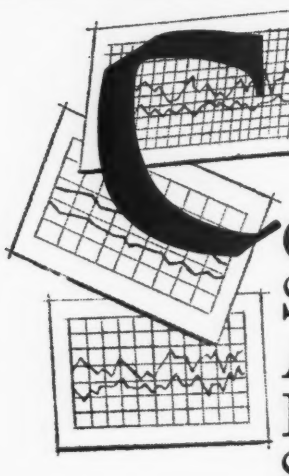

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Compounder's Corner

Lipstick Patent

Henry K. Jarrett has been issued U. S. Patent 2,853,422 covering a lipstick incorporating water-soluble dyes. Claim one follows:

"A substantially anhydrous lipstick which has a base which consists substantially wholly of fusible wax material and a mixture of propylene glycol and polyethylene glycol leci-oleate ester, said lipstick having dye incorporated therein, substantially all of said dye being soluble in water, said polyethylene glycol leci-oleate ester being compatible with said fusible wax material and being a solvent for said dye, said polyethylene glycol leci-oleate ester comprising at least substantially fifty per cent by weight of said lipstick, said propylene glycol comprising substantially ten per cent by weight of said lipstick, said water-soluble dye being wholly dissolved in said mixture of said propylene glycol and said polyethylene glycol leci-oleate ester, at least some of said dye being dissolved in the polyethylene glycol leci-oleate ester of said mixture, the solution of said dye in said mixture being dispersed in said fusible wax material in the form of drops and veins."

Cationic Shampoo

A novel cationic shampoo is described in Swiss Patent No. 327,517, Ciba A. G. Basel. It incorporates at least one cationic compound in the form of a water-soluble salt. It must have at least one basic nitrogen atom and at least one non-aromatic radical with more than six carbon atoms.

Seven parts of lactic acid (90 per cent) are mixed with 21.6 parts of the above-described quaternary ammonium salt, 7.75 parts of a water-soluble condensate of tertiary dodecyl mercaptan and ethylene oxide, 4.9 parts of N-oxyethyl coconut fatty acid amide, two parts of (p-stearoylaminophenyl)-trimethylammonium methyl sulfate and 56 parts of water.

The quaternary ammonium salt can be made as follows: 28.3 parts of N,N-dimethylethanolamine esterified with coconut fatty acid and 10.3 parts of chloroacetic acid amide are heated with agitation in a stream of nitrogen in a boiling water bath until the product of the reaction is clearly water-soluble, which takes place in a short time.

PVP Tablet Granulation

A new booklet describing tablet-binding and granulating with Plasdone, the pharmaceutical grade of PVP (polyvinylpyrrolidone), is offered on request by Antara Chemicals, a sales division of General Aniline & Film Corporation, 435 Hudson Street, New York 14, N. Y.

The booklet details the use of Plasdone in wet granulation, direct compression, slugging and encapsulating. Typical granulation formulas are included.

Plasdone is designed to save production time, make a wide range of new tablets feasible, and improve disintegration characteristics. The adhesive and film-forming agent is soluble in water and organic solvents, and is chemically inert.

Cold Wave Preparations

The search for new and better cold wave preparations is carried on by chemists around the world. Some of its results are described in an article by A. Vesterman, University of Liege, in *Parfumerie, Cosmetique, Savons*, p. 222, 1958. Having traced the development and chemistry of the cold wave process, the author describes experimental work which led to the establishment of certain stipulations of purity, concentration and pH of the solution. The question of toxicity is discussed and the relationship between purity and toxic properties receives attention.

Although ammonuim thioglycolate exhibits good waving power and low toxicity, improvements have been attempted by substitution of the ammonium by another cation and by replacement of thioglycolic acid by another mercaptan. Sodium and potassium are not suitable because they raise the pH to undesirable levels, whereas diethanolamine and triethanolamine depress the pH below the level at which the hair swells sufficiently. This level is in the vicinity of 9.5.

Substitution of ammonium by monoethanolamine yields good results and has been in commercial use for several years. The advantage here is elimination of the ammoniacal odor. A well chosen perfume can mask the remaining odor of thioglycolic acid. At equal concentration and pH solutions of monoethanolamine thioglycolate perform as well as solutions of ammonium thioglycolate.

The fact that the base of the monoethanolamine thioglycolate is not volatile is both a danger and an advantage. The product is stable in storage but continues to react on the hair if not completely removed by neutralization and washing. Its safe use requires great care. This danger does not exist with the ammonium compound. Once the ammonia is volatilized the pH drops and the product ceases to react.

Attempts to substitute mercaptans have been less successful. Thiolactic acid offers no advantages over thioglycolic and is more expensive. Thioglycerol is suspected of higher toxicity and is more expensive. Furthermore, it is not stable in alkaline

medium. Additions of ammonia are required if it is to be used for cold waving.

Permanent wave preparations based on sulfites or bisulfites are odorless, have a neutral pH, and do not attack the hair, but they act five or six times more slowly than conventional products and the life of the wave is shorter.

Recent suggestions include products based on glycol, propyleneglycol, or glycerol monothioglycolates with pH levels ranging from four to seven. Evidence is as yet incomplete but the author does not regard these compounds as very promising. The use of ammonium thioglycolate in combination with a catalyst is discussed. This type of solution is still in the experimental stage and presents a number of technical difficulties.

Finally the author describes the use of paper impregnated with thioglycolate, a home permanent system in commercial use in the United States. In summary, it must be said that so far ammonium thioglycolate has not been seriously challenged in the cold wave field.

Skin "Food"

Growth of epidermal cells is encouraged by regular treatment with a cream containing certain active principles, according to French patent 1,142,927. Such a product might contain.

	Per cent
Lanolin	6-12
Cetyl alcohol	0.5- 1.5
Shark oil	15-20
Propylene glycol	5-15
Glyceryl mono-oleate	20-30

and 50,000 I.U. of vitamin A; 25,000 I.U. of vitamin D; water, perfume, and preservative. The shark oil must be deodorized by catalytic hydrogenation prior to incorporation in cosmetic specialties.

Synthetic Wax

Pentaerythritol tetrastearate, a hard, high-melting wax, is the subject of a new Hercules Powder Company product data sheet. This synthetic is ivory-colored, essentially neutral, manufactured under controlled conditions and not subject to the price fluctuations of natural waxes. It is suggested for use in polishes, coatings and textile finishing; it may find application in lipstick formulations, as a cosmetic cream component, and in aerosols.

The softening point of PE Tetrastearate is 61-72°C., its setting point 54-65. Maximum acid number is 1.5, saponification number 185-205 and iodine number 2. The wax is soluble hot in all concentrations in most esters, ketones, chlorinated solvents, aliphatic hydrocarbons and aromatic hydrocarbons and may form solid solutions or give a waxy precipitate on cooling. It is partially compatible with paraffin wax, carnauba wax, ethyl cellulose and a number of synthetics.

Ascorbic Acid Tablets

Assay results indicate the relative effectiveness of the various additives used by S. M. Blaugh, D. Chakravarty and J. L. Lach (*Drug Standards* 26: 199, 1958). Corn starch paste was not a satisfactory granulating agent since the granules remained in contact with water during the drying period. Granulating with an alcoholic solution of ethyl cellulose not only accelerated drying and avoided contact with water, but also coated the granules with a protective film. It was found that anhydrous isopropyl alcohol was a more satisfactory vehicle for ethyl cellulose than anhydrous ethanol. Moreover, double granulation with ethyl cellulose yielded a product more stable than one prepared by single granulation.

The use of chelating agents slightly diminished the extent of oxidation of ascorbic acid in the tablet formulations. However, the use of these agents is no substitute for procedures and materials that avoid metallic ion contamination. Precoating ascorbic acid with ethyl cellulose and granulating with ethyl cellulose afforded good protection against accelerated oxidation due to metallic ion contamination.

Sodium bisulfite and thiourea showed little or no effect on the stability of the ascorbic acid tablet formulations.

Tablets stored in the constant temperature humidity cabinet at 60° discolored rapidly. Moisture greatly accelerated color formation. Kaolin as a moisture absorbent was not superior to lactose. Tablets prepared using anhydrous calcium sulfate as the filler in place of lactose exhibited the best color stability.

The disintegration times and hardness of the tablets were determined after the tablets had been stored for several months. No alteration in either property was noted.

Since moisture is a factor in the oxidation and discoloration of ascorbic acid tablets, the closure for containers of ascorbic acid tablets should be effective moisture vapor barriers. In a study by Blaugh, Hickman, and Lach, a metal screw cap lined with 0.040 inch solid polyethylene or with 0.0035 inch aluminum foil laminated to Kraft paper and coated with a vinyl coating was recommended.

Zinc Oxide Suspensions

The effects of a number of salts of citric, tartaric, succinic and malic acid on the stability of zinc oxide suspensions were studied by Y. S. Koh and R. E. Hopponen (*Drug Standards* 27: 21, 1959). Sodium, potassium and ammonium bitartrates were found to produce a marked reduction in the settling rate. A combination of bitartrate and Veegum produced suspensions of excellent stability. These studies were extended to the development of calamin lotion formulas which might possess advantages over the official formula.

Polykol Drops (Upjohn) are available in 30 cc. dropper bottles. The preparation contains 200 mg. of oxyethylene oxyprophylene polymer, a nonionic surfactant, in each cc. and is intended for the prevention and treatment of constipation associated with hard, dry stools.

Polymagma Plain (Wyeth) is an antidiarrheal containing in each 30 cc. three grams of activated attapulgite and 270 mg. of pectin in a special alumina gel. The suspension is supplied in 12 ounce bottles.

Pro-Duosterone (Roussel) provides 50 mg. of ethisterone and 0.03 mg. of ethinyl estradiol in each tablet and is suggested as a safe, simple oral diagnostic test with more than 98 per cent accuracy for early pregnancy. It is available in bottles of 24 tablets.

Halodrin (Upjohn) contains in each tablet 1.0 mg. of fluoxymesterone (9-fluoro-11-hydroxy-17-methyltestosterone) and 0.02 mg. of ethinyl estradiol and is available in bottles of 100 tablets.

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Trade Literature

Surface Active Agents

The Onyx Oil & Chemical Company, Jersey City 2, N. J., has published a new 24-page catalog of its surface active agents. Each product is described by trade name, active ingredient, percentage of activity, physical state, general use, specific applications and properties.

The products are divided into three classes: anionic, cationic and nonionic, and a section explains the chemistry of each of these groups.

Pony Mixers

The J. H. Day Company, Division of the Cleveland Automatic Machine Company, 4932 Beech Street, Cincinnati 12, Ohio, has made available an eight-page bulletin describing its line of Day Pony Mixers for efficient change-can mixing. Construction details and specifications are given for gearless-type single and twin motion mixers, and for geared-type laboratory and production mixers. Accessory equipment is also described.

Structure and Musk Odour

The Research Department of Polak & Schwarz, Hilversum, Holland, has published the first in a series of articles, Structure and Musk Odour, which treats Indane Derivatives, by M.G.J. Beets, H. Van Essen and W. Meerburg. Reprinted from *Recueil des Travaux Chimiques Des Pays-Bas*, the 17-page paper describes a series of new indane derivatives with musk odor.

Millivoltmeters

A new 28-page catalog covering operating principles, specifications, features and ordering information on noncontrol and control millivoltmeters has been published by the Minneapolis - Honeywell Regulator Company, Wayne and Windrim Avenues, Philadelphia 44, Penna. The catalog includes information on all control models, such as Pyr-O-Vane, pulse Pyr-O-Vane, Protect-O-Vane and the Pyr-O-Volt controller. Request Catalog C10-1, from W. A. Lang.

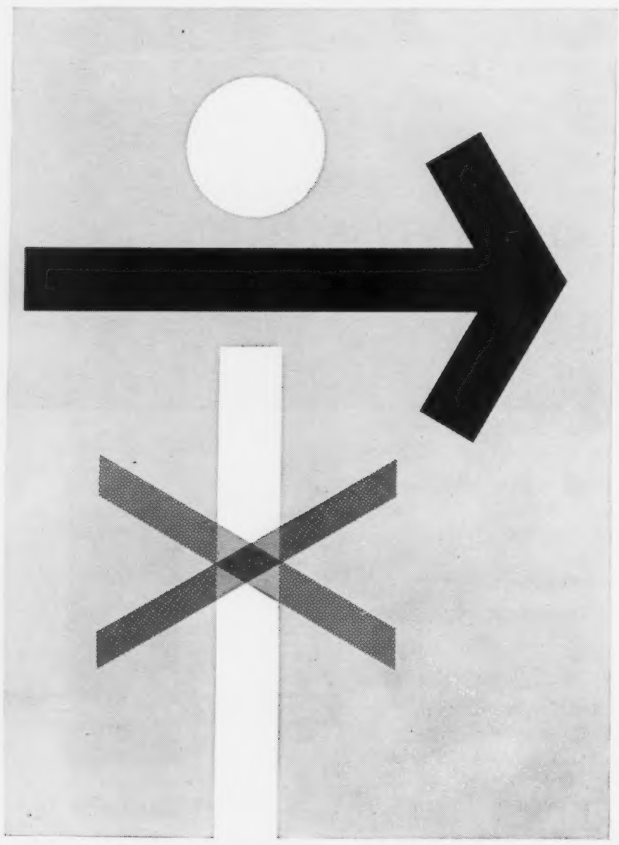
Butenediol

A revised and enlarged technical bulletin on 2-butene-1, 4-diol has been issued by the Commercial Development Department of General Aniline & Film Corporation, 435 Hudson Street, New York City 14.

The bulletin, A-109, describes the physical properties of butenediol and outlines the major types of chemical reactions in which it can take part, including esterification, epoxidation, copolymerization and isomerization. It also discusses the applications of butenediol derivatives.

Timed Disintegration Capsules

Nysco Laboratories, Inc., 34-24 Vernon Blvd., Long Island City 6, New York, has published a four-page brochure on the firm's Nyscaps, timed disintegration capsules. In full color, the brochure illustrates the more than 30 Nyscap formulations available, showing colors and sizes of the capsules as well as the granules, and providing more detailed information on the products. Brochure RL2 may be requested from Sales Service Department.



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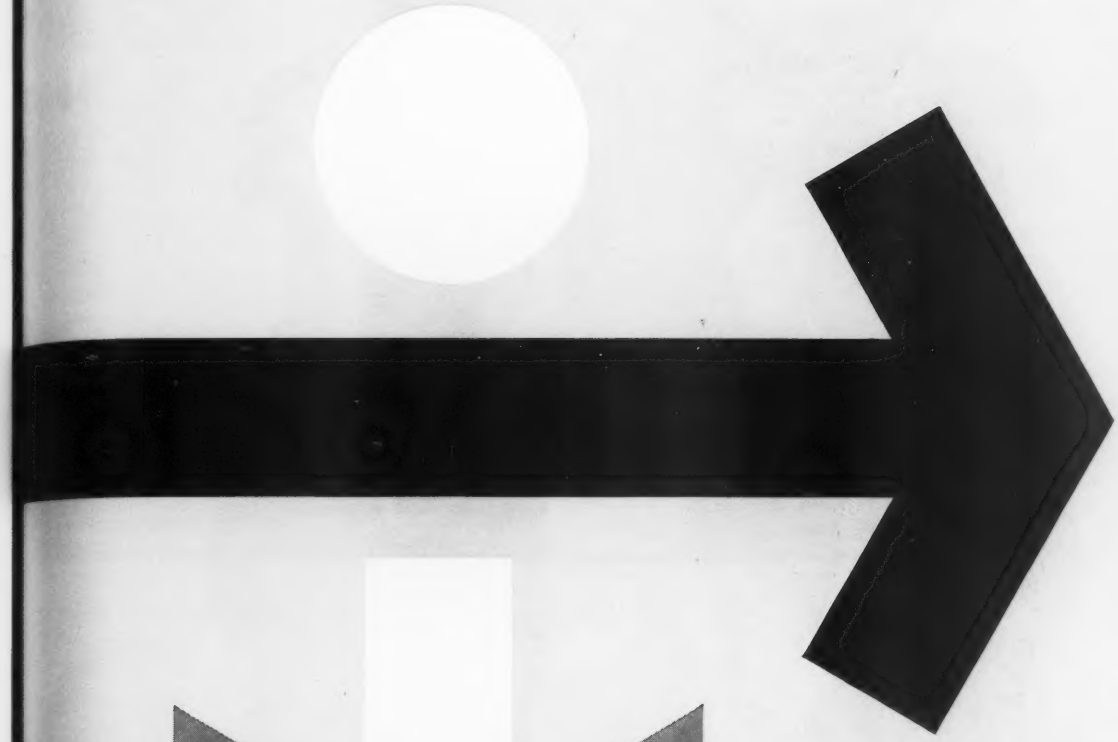

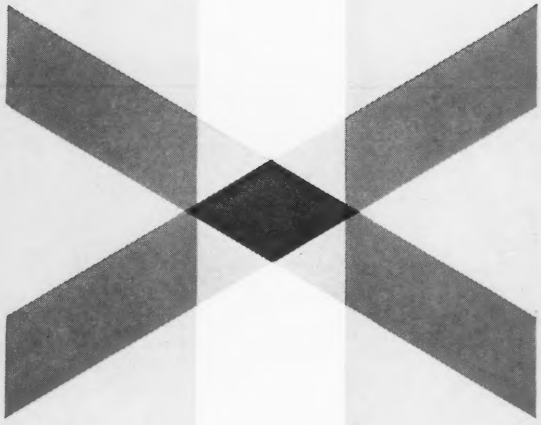

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(*Continued from page 433*)

Biumba, at an altitude of about 6,000 feet and with a rainfall of 60 to 75 inches per year. Most of the geranium plantings are on marshy land, which seems rather unusual in view of the danger of root rot, which readily attacks geranium. However, growers contend that in Ruanda the dry season lasts so long (four months) that geranium could not be cultivated successfully on dry land.

The writer visited one plantation located near the lakes of Bulera and Bunyoni and the volcanoes Sabinio and Muhavura—roughly 50 miles from Ruhengeri and near the famous virgin forest reserves of gorillas and elephants. These great rain forests are a magnificent country of primeval African beauty. The geranium fields in this area show the effect of much neglect, being overgrown with weeds. No wonder the yield of oil has fallen off substantially!

Growers in Ruanda claim that under normal conditions one acre of geranium should produce from 22 to 26 pounds of oil per year. The plants are spaced at 2½ feet, in rows 2½ feet apart. The stills, of concrete and rather crude, hold about 1,700 pounds of plant material per charge; distillation requires two hours. One thousand, seven hundred pounds of plant material, slightly dried in the field, are required to obtain a single pound of oil.

Another geranium plantation that the writer visited was located near Kigali, capital of Ruanda. This producer has 250 acres set aside for geranium, although only 100 acres are actaully under that plant, the rest being rotated. For best yields a geranium field should be renewed after two years, when productivity declines sharply: the plants seem to degenerate, probably because by that time the roots have grown deep enough into the marshy soil to reach water level. A new planting may be set out on an old geranium field after the latter has been rotated for two years. There are three cuttings per year.

The cut herb is left to dry in the field for two days then distilled. On the plantation just mentioned there are three metal stills, each of about two cubic meters capacity. Distillation of one charge lasts about three hours.

In general, growers of geranium in Ruanda are not too optimistic about the future of the industry. It is their opinion that, to be profitable, the oil should fetch prices ranging from at least $15.00 to $20.00 (U.S.) per pound—not too high a figure in view of the prices now prevailing for the Reunion product.

Oil of Mawah

This oil—a kind of low-grade geranium oil—was produced in the Congo during the course of, and right after, World War II, and during the Korean War, in other words, at times when pure geranium oil had become scarce or very expensive. Production in the Congo during these periods of emergency reached as much as 8,000 pounds per year. Today very little, if any, mawah oil comes from the Congo and neighboring Ruanda. The oil is now produced chiefly in Kenya Colony.

HAIR SPRAY PATENT

(*Continued from page 434*)

"Another object is to be able to provide controlled flexibility of the film by combining a plasticizer with the other materials forming the composition.

"In order to apply the film of polymerized N-vinyl pyrrolidone to the surface of the hair and achieve the desired results in a short time, I may dissolve the product in a quick drying solvent, such as ethyl alcohol. Since polymerized N-vinyl pyrrolidone is soluble in both alcohol and water, it is not critical if there is a negligible quantity of water present in the alcohol. However, where my hair styling composition is to be used in a spray-type container having self-generated pressure, I have found that it is possible to use an alcoholic solution of the polymerized N-vinyl pyrrolidone with dichlorodifluoromethane (or related compounds and mixtures thereof commonly known in the trade as Freon) as a propellant."

Below are listed the nine claims of the patent:

1. "A substantially water-free sprayable liquid hair styling preparation for applying to the surface of the hair for setting and lusterizing the same, comprising polyvinylpyrrolidone, alcohol, and a propellant selected from the group consisting of fluorochloromethanes and fluorochloroethanes.

2. "A hair styling preparation for spraying under self-generated pressure upon the surface of the hair for setting and lusterizing thereof, composed of a substantially water-free solution of polyvinylpyrrolidone, absolute ethyl alcohol, and dichlorodifluoromethane.

3. "A hair styling composition for setting and lusterizing the hair by spray application, composed of polyvinylpyrrolidone and di-ethyl phthalate mutually dissolved as a substantially water-free solution in ethyl alcohol in combination with dichlorodifluoromethane as a propellant.

4. "A substantially water-free hair styling preparation suitable for spray application for setting and lusterizing the hair, comprising from 4 to 8 per cent of polyvinylpyrrolidone in an ethyl alcohol solution, and a propellant selected from the group consisting of fluorochloromethanes and fluorochloroethanes.

5. "As a hair styling preparation, a substantially water-free ethyl alcohol solution of polyvinylpyrrolidone in combination with dichlorodifluoromethane as a propellant, for effecting the spray application of the solution onto hair.

6. "A substantially water-free hair styling composition for spray application for setting and lusteriz-

(*Continued on page 518*)

COMING EVENTS . . . . .

APRIL

20 **American Society of Perfumers,** annual symposium, Essex House, N. Y. C. (Edward Shuster, van Ameringen-Haebler, Inc., 521 West 57th St., N. Y. C. 19)

20-22 **American Oil Chemists' Society,** 50th anniversary meeting, Hotel Roosevelt, New Orleans, La.

28 **Association of Consulting Chemists & Chemical Engineers,** symposium and banquet, Shelburne Hotel, N. Y. C. (A. B. Bowers, Director of Publicity, A.C.C. & C.E., 50 E. 41st St., N. Y. C. 17)

29-30 **Manufacturing Chemists' Assn.,** packaging & transportation symposium, Engineering & Scientific Center, Cleveland, Ohio. (M. F. Crass, Jr., Secretary, M.C.A., 1625 Eye St., N.W., Washington 6, D.C.)

MAY

6-8 **American Institute of Chemists,** annual meeting, Traymore Hotel, Atlantic City, N. J.

7 **Society of Cosmetic Chemists, spring meeting, Hotel** Commodore, N. Y. C. (Robert A. Kramer, Evans Chemetics, Inc., 250 E. 43rd St., N. Y. C.)

10-13 **Proprietary Assn.,** Greenbrier Hotel, White Sulphur Springs, West Virginia (Dr. Howard A. Prentice, 810 18th St., N.W., Washington 6, D.C.)

10-13 **Flavoring Extract Manufacturers Assn.,** annual convention, Hotel Roosevelt, N. Y. C. (Robert Krone, Fritzsche Bros., Inc., 76 Ninth Avenue, N. Y. C.)

10-15 **Society of American Bacteriologists,** St. Louis, Mo. (E. M. Foster, Dept. of Bacteriology, University of Wisconsin, Madison 6, Wisc.)

12-14 **Toilet Goods Assn.,** annual convention and Scientific Section meeting, Waldorf-Astoria Hotel, N. Y. C. (Kathryn Fitzpatrick, T.G.A., Americas Bldg. Rockefeller Center, N. Y. C. 20)

14-18 **Toilet Goods Manufacturers' Assn. of Canada,** annual general meeting and convention, Whiteface Inn, Whiteface, New York (Mrs. Agnes Howard, T.G.M.A., 252 Eglinton Ave. East, Toronto 12 Ontario)

17-19 **American College of Apothecaries,** annual convention, Hotel Roosevelt, New Orleans (A.C.P., Hamilton Court Hotel, 39th & Chestnut Streets, Philadelphia 4)

17-20 **Flavoring Extract Manufacturers Assn.,** annual convention, Traymore Hotel, Atlantic City, N. J.

18-20 **Chemical Specialties Manufacturers Assn.,** midyear meeting, Drake Hotel, Chicago (Herbert W. Hamilton, 50 E. 41st St., N. Y. C. 17)

18-21 **Glass Container Manufacturers Institute,** spring meeting, Greenbrier Hotel, White Sulphur Springs, West Virginia (H. W. Kuni, 99 Park Ave., N. Y. C. 16)

20-24 **National Paper Box Manufacturers Assn.,** annual convention, Hotel Sheraton, Philadelphia (Norman T. Baldwin, N.P.B.M.A., Liberty Trust Bldg. Philadelphia 7)

21-24 **National Beauty and Barber Manufacturers' Assn.,** annual convention, Concord Hotel, Kiamesha Lake, N. Y. (Warren Freedman, Clairol, Inc., 510 Sixth Ave., N. Y. C.)

25-27 **Pharmaceutical Manufacturers Assn.,** Production and Engineering Section, The Cloister, Sea Island, Ga.

25-28 **American Society of Mechanical Engineers,** design engineering show and design engineering conference, Convention Hall, Philadelphia (Clapp & Poliak, Inc., 341 Madison Ave., N. Y. C. 17)

JUNE

1-4 **American Dermatological Assn.,** Claridge Hotel, Atlantic City (Dr. Wiley M. Sams, 25 Southeast Second Ave., Miami, Fla.)

8-12 **American Medical Assn.,** annual meeting, Atlantic City (Dr. George F. Lull, 535 N. Dearborn St., Chicago 10)

9-12 **Material Handling Institute, exposition,** Cleveland Auditorium, Cleveland, Ohio; Concurrently, **American Material Handling Society,** technical sessions (M.H.I., One Gateway Center, Pittsburgh 22, Pa.

11-13 **Manufacturing Chemists' Assn.,** annual meeting, Greenbrier Hotel, White Sulphur Springs, W. Va. (M. F. Crass, Jr., M.C.A. 1825 Connecticut Ave., N.W., Washington 9, D. C.)

12 **Parenteral Drug Assn.,** dinner meeting, Sylvania Hotel, Philadelphia, Penna.

15-19 **Gordon Research Conference** (Lipide Metabolism), Kimball Union Academy, Meriden, N. H. (W. G. Parks, Dept. of Chemistry, Univ. of Rhode Island, Kingston, R. I.)

22-23 **American Animal Health Pharmaceutical Assn.,** annual convention, Hotel President, Kansas City, Mo. (N. M. Ferguson, A.A.H.P.A., 3801 Cullen Blvd., Houston 4, Texas)

JULY

13-17 **Gordon Research Conference** (Chemistry, Physiology and Structure of Bones and Teeth), Kimball Union Academy, Meriden, N. H. (See above.)

20-24 **Gordon Research Conference** (Cell Structure and Metabolism), Kimball Union Academy, Meriden, N. H. (See above.)

20-24 **Gordon Research Conference** (Microbiological Deterioration), New Hampton School, New Hampton, N. H. (See above.)

AUGUST

3-7 **Gordon Research Conference** (Medicinal Chemistry), Colby Junior College, New London, N. H. (See above.)

3-7 **Gordon Research Conference** (Steroids and Related Natural Products), New Hampton, N. H. (See above.)

10-14 **Gordon Research Conference** (Toxicology and Safety Evaluation), Kimball Union Academy, Meriden, N. H. (See above.)

11-13 **Western Packaging & Materials Handling Exposition,** Civic Auditorium, San Francisco

16-23 **American Pharmaceutical Assn.,** annual meeting, Netherlands-Hilton Hotel, Cincinnati, Ohio (Dr. Robert P. Fischelis, 2215 Constitution Ave., N.W., Washington 7, D.C.)

17-21 **Gordon Research Conference** (Food and Nutrition), Colby Junior College, New London, N. H. (See above.)

23-26 **National Pharmaceutical Council,** pharmacy education-industry forum, Princeton Inn, Princeton, N. J.

30 **Federal Wholesale Druggists' Assn.,** annual convention (through Sept. 2), Greenbrier Hotel, White Sulphur Springs, West Virginia (R. C. Schlotterer, F.W.D.A., 2 Lexington Ave., N. Y. C. 10)

SEPTEMBER

9-11 **Pharmaceutical Manufacturers Assn.,** International Section, Greenbrier Hotel, White Sulphur Springs, W. Va.

13-18 **American Chemical Society,** national meeting, Atlantic City, N. J. (Alden H. Emery, Executive Secretary, 115 Sixteenth St., N.W., Washington 6, D.C.)

17-20 **Drug, Chemical & Allied Trades Section, New York Board of Trade,** annual meeting, Sagamore Hotel, Bolton Landing, Lake George, N. Y. (Helen I. Booth, D.C.A.T., 291 Broadway, N. Y. C 7)

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HAIR SPRAY PATENT

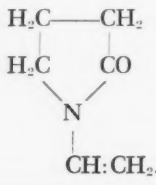
(*Continued from page 515*)

ing the hair, comprising a mixture of at least 4 per cent polyvinylpyrrolidone dissolved in alcohol, with a propellant selected from the group consisting of fluorochloromethanes and fluorochloroethanes.

7. "A substantially water-free hair styling composition for spray application for setting and lusterizing the hair, comprising from 4 per cent to 8 per cent of polyvinylpyrrolidone in solution in absolute ethyl alcohol and, as a propellant, dichlorodifluoromethane.

8. "A sprayable hair preparation, comprising a snubstantially water-free alcoholic solution of polyvinylpyrrolidone and Freon.

9. "A sprayable hair preparation comprising Freon, and a substantially water-free alcoholic solution of a product essentially consisting of polymerized units of the structure



TRANQUILLITY

(*Continued from page 437*)

tions is of particular interest to us now: the control of excitement and hallucination in schizophrenia and other severe psychotic states, as well as in alcoholic psychosis, delirium tremens, and in the severe withdrawal symptoms following drug addiction.

The third type of tranquilizer and the one most suited to office practice is represented by meprobamate, known commercially as Equanil or Miltown. The Lilly tranquilizer, phenaglycodol, is related structurally to meprobamate, both drugs being of the alkanediol type.

A fourth classification of tranquilizers is the diphenylmethanes, some of which combat anxiety and others hallucinations. This group includes hydroxyzine, benactyzine and azacyclonol.

The extensive use of tranquilizers today is due not only to pressures caused by the rapid pace of modern industrial civilization, but also to the age-old interrelationship between the body and the mind, which causes nervous complications in organic diseases, as well as organic complications from nervous diseases.

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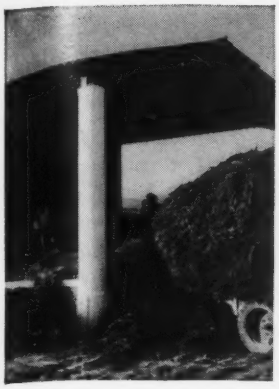
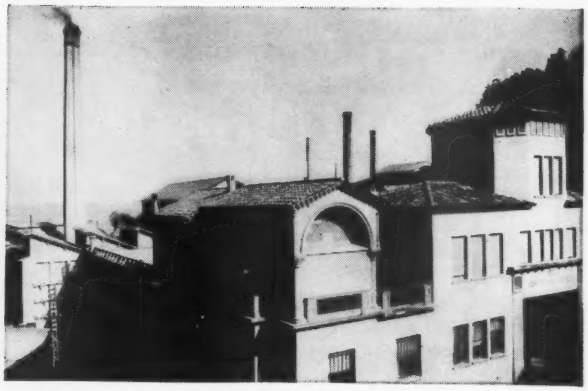
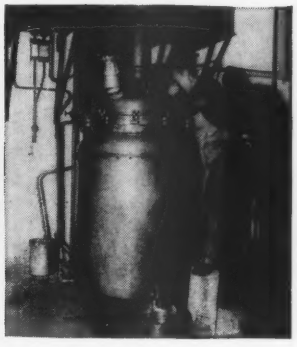
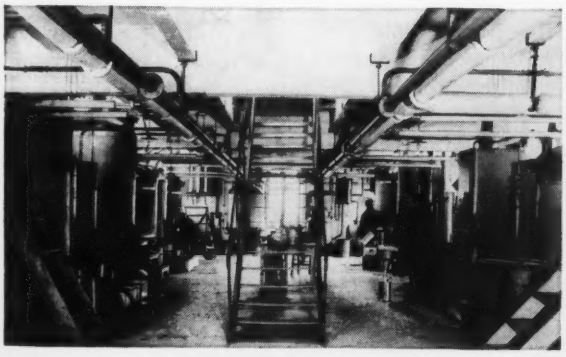
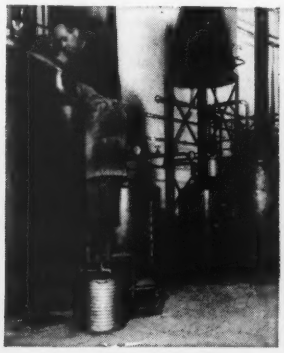




CAPACITY



QUALITY

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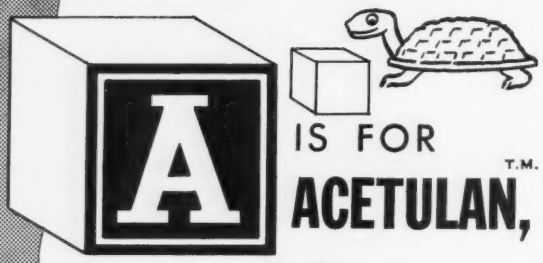

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skin diseases, metabolic disorders, and gastrointestinal disturbances such as peptic ulcer and colitis. It may also be a major element in functional diarrhea and constipation.

We have cited several examples of physical complaints resulting from neurosis. Let us now review some of the physical disease states in which a neurosis may be a complication. Patients with overactive thyroids are typically distraught, tense, and hyperactive. Anxiety and fear play a major part in all forms of heart disease.

Anxiety is an inevitable component of all pain. As a result, relief from anxiety in patients suffering pain reduces their need for pain-killing drugs.

Hypnotics and Sedatives

The category of hypnotics and sedatives accounts for two per cent or approximately 34 million dollars of the drug volume of sales. Competition is keen but product obsolescence of the older compounds is low primarily because this phase of research competition was faced many years ago.

By definition, hypnotics and sedatives are central nervous system depressants and may be roughly divided into two classes: barbiturates and nonbarbiturates. The barbiturates, which represent almost 75 per cent of this market, are, by and large, old compounds that have become firmly entrenched through years of usage. During the last 50 years literally hundreds of new barbiturates have been synthesized. Of these over a score have found their way into trade channels. Research aimed at still more barbiturate-type hypnotics is almost nonexistent primarily because the compounds now available run the gamut from short to intermediate to long-acting, and are characterized by minimal side effects other than the possibility of habituation. This possibility has been one of the reasons for developing and marketing a number of nonbarbiturate hypnotics. The size of the market, however, has been a limiting factor for the magnitude of the program.

LEADING BARBITURATES
$24,000,000
ALURATE (Roche)
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BUTISOL (McNeil)
NEMBUTAL (Abbott)
PHENOBARBITAL (Various Companies)
SECONAL (Eli Lilly)
TUINAL (Eli Lilly)

LEADING NON-BARBITURATES
$10,400,000
DORIDEN (Ciba)
NOCTEC (Squibb)
NOLADAR (Roche)
PLACIDYL (Abbott)
VALMID (Eli Lilly)

No mention of the sedative market would be complete without at least a mention of the bromides. The advent of newer more potent compounds not characterized by the severe bromide side effects of skin rash

(*Continued on page 522*)

Reader's Questions . . .

Cold Cream: *What should the pH of a cold cream be? I refer to the standard product made with beeswax, borax, mineral oil and water with the possible addition of other wax and oil ingredients that are neutral.* BROOKLYN.

A long time ago I made a laboratory study of cold cream formulations that has been of immense help to me in the general problems of formulating cosmetic creams. The results were reported in an article which appeared in this magazine, volume 39, page 736, 1936. In summary, the cream will be more or less alkaline, depending upon the proportion of borax, that is the ratio of borax to beeswax, in the formula. This standard cream cannot be acid in its reaction. Its stability depends upon the formation of a sodium soap from the free fatty acid in the beeswax and the borax. The boric acid liberated is buffered back, aside from its weakness as an acid, by the soap or by excess borax. As a rule, the pH of the cold cream will be close to 8.

This definite statement nevertheless requires qualification: It is true only if the particular formula and processing results in an oil-in-water emulsion. A water-in-oil emulsion, with a continuous oil phase and a discontinuous aqueous phase should not provide trustworthy pH readings with either indicator paper or meter. If the cream is diluted with water before measurement, it undergoes inversion to an oil-in-water product. Even if the readings can be obtained and interpreted, it is not certain that they have any application to the acid mantle theory.

Because of the special nature of beeswax itself, a water-in-oil cream results in the absence of borax and mixed emulsions are produced when too small a proportion of the beeswax fatty acid is neutralized. If the proportion of water is too low and the oil too high, oil will be in the outer phase. Some creams will tend to invert on standing for a long period of time. Good cold creams can be made by the use of other emulsifiers than the borax soap.

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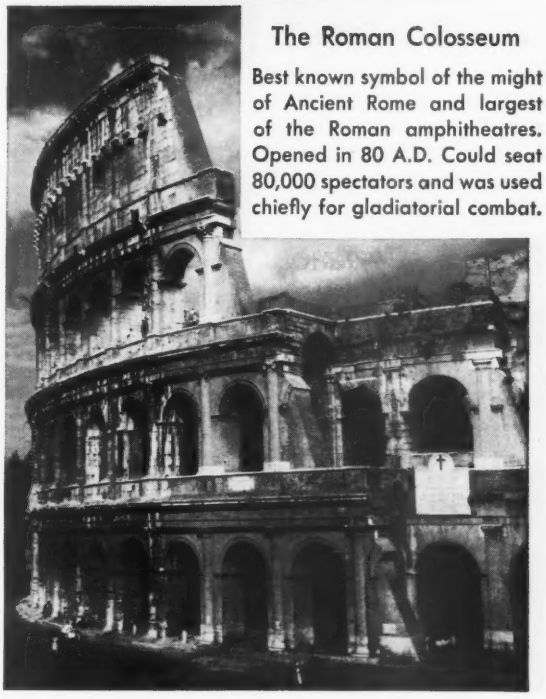

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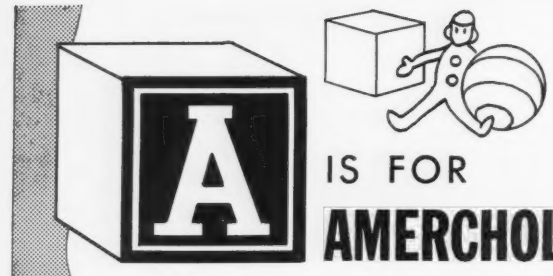

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AMERCHOL PARK — EDISON, N. J.

(*Continued from page 520*)

and mental confusion has led to gradual abandonment of this ancient sedative. Chloral hydrate, another old timer, has suffered somewhat the same fate, although in Europe the compound is accepted as an excellent hypnotic.

Anti-convulsants

Anti-convulsants are drugs which control or prevent epileptic seizures. The market is small and rather highly specialized. Total sales in 1958 were approximately $6,500,000 or less than one-half of one per cent of the total pharmaceutical market. In general, compounds closely related to the barbiturates have been found to be most effective as anti-convulsants. The relatively few products marketed as anti-convulsants is a reflection of the limited medical applications of the product class; namely, grand mal and petit mal eleptiform seizures. It should be pointed out again that certain of the tranquilizers have anti-convulsant activity.

LEADING ANTICONVULSANTS
CELONTIN (Parke, Davis)
DILANTIN (Parke, Davis)
MESANTOIN (Sandoz)
MILONTIN (Parke, Davis)
MYSOLINE (Ayerst)
PARADIONE (Abbott)

Research Continues in Mental Health Drugs

Hypnotics, sedatives and anti-convulsants have been the subject of intensive research efforts during the course of the last 50 years. A minimal research program continues today. However, the development of many satisfactory agents leaves little room for further major advances.

Conversely, research in the field of tranquilizers not only continues but is being expanded. Medical and pharmaceutical research still have far to go. We have made psychotic patients quieter and easier to handle. We have reduced the fear inspired by their hallucinations, but we have not cured their psychoses. This is still a long-term objective and one of the major challenges to pharmaceutical research. Some of the mentally ill hidden from sight in the back wards of mental institutions have regressed to the point where none of the available drugs appear to have any effect. Their condition is a major challenge to research in psychiatric drugs.

Other fascinating research opportunities are posed by our present limited knowledge of psychosomatic relationships. No one knows whether this dark corner of science, when ultimately illuminated, may not yield the solution to such diseases as diabetes, intractable skin diseases, excruciatingly painful muscular disorders, juvenile delinquency, rheumatoid arthritis, and perhaps even certain phases of cancer.

First of all, we need to know much more about the human brain, or even the animal brain, which is more accessible to experimentation. We know today of several substances naturally found in the brain

and in other parts of the body which undoubtedly play a role in both normal and abnormal brain function. Certain drugs such as lysergic acid diethylamide produce a temporary psychotic state in man, but this state is not identical with any of the natural psychoses. The artificial psychosis which may thus be induced in volunteers could be used to test new experimental drugs.

Serotonin, a natural hormonelike substance, is closely related to a common protein component, tryptophan. There is reason to believe that failure to control natural break-down in the body may produce abnormal psychic states. The same is true of a breakdown product of adrenalin. These substances are amines. They are normally destroyed at a reasonable rate by a biological catalyst or enzyme known as monoamine oxidase. It is known that reserpine hastens the break-down of these amines, thereby lowering the blood pressure and quieting nervous tension, while many drugs, including iproniazid, can be classified as monoaminooxidase inhibitors, tending to raise blood pressure and induce a more optimistic, less depressed psychic state.

The facilities and personnel required to conduct research programs of the type which might give us answers to some of these problems are extremely expensive. The problems which face the research worker in his attempt to develop new and better compounds are great indeed.

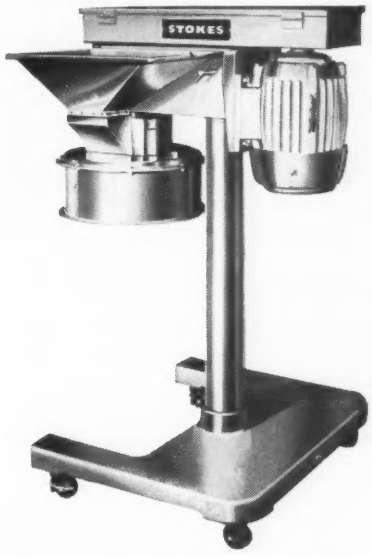
Chemical laboratories are synthesizing new derivatives of previously known medicaments and also following clues turned up by pharmacologists, based on earlier observations on experimental animals. As fast as these newer chemical compounds are available for pharmacological study, their effects on animals are systematically explored. This requires vast knowledge and experience, much time, elaborate equipment and great ingenuity.

Different species of animals often react differently to identical experimental drugs, and failure of a drug to register the hoped-for reaction in one or more species does not exclude the possibility in another species of the drug's showing an effect that may carry over to humans. However, animal reactions are accepted only tentatively and require adequate confirmation in man before any new drug can be marketed.

PERFUME FORMULATION

(Continued from page 439)

ingly large quantity of this foul smelling chemical (indole) can be tolerated in the makeup of a lilac fragrance. This phenomenon of high tolerance has recently acquired great importance in industrial perfumery, in the creation of "masks" for disagreeable fecal-like odors of the indole type. For this work a very cheap lilac-type odor is made up without any



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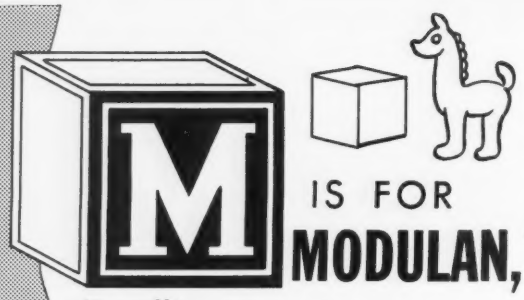

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notes of the indole type. Then when this product is applied as a mask to a disagreeable odor situation, the unpleasant odor becomes part of the lilac fragrance and is transformed into a more pleasant effect. Technically, this is known as "masking by inclusion." Some industrial odor situations where this procedure is effective are: mercaptan odors associated with rubber vulcanizing, butyric odors from fermentations, indoloid odors from protein decomposition, and the effluent odors from sewage operations.

INDUSTRIAL LILAC MASK E.042

600	Terpineol
200	Phenylethyl alcohol soap grade
100	Benzyl acetate
5	Paracresyl acetate
5	Paracresyl methyl ether
10	Ionone AB soap grade
80	Amyl cinnamic aldehyde
1,000	

ACACIA

There are many species of acacia trees, all bearing fragrant flowers, but the *robinia pseudacacia*, commonly known as the "locust" tree, is the only one of importance in North America. The pale white-yellow blossoms hang like wisteria flowers from the tree branches, and produce an intensely sweet fragrance somewhat reminiscent of hawthorn. The acacia fragrance is classified in the lilac group because its formulation requires a large amount of the lilac chemical, anisic aldehyde. For some unknown reason the acacia fragrance does not seem to have much popularity as a "solo" fragrance, but it does find considerable use as a floral base in the creation of fantasies, and as an adjuvant in floral situations where lilac might be used.

Following are the "purpose" classifications of the acacia components.

Basics. Anisic aldehyde, paramethyl acetophenone, phenylacetic acid, methyl anthranilate, dimethyl anthranilate, geranium oil Algerian, Acaciol (Schiff's base of anisic aldehyde and methyl anthranilate).

Blenders. Linalool, rhodinol, citronellol, geraniol, benzyl acetate, terpineol, phenylacetaldehyde, paramethyl hydratropic aldehyde, dimethyl octanol, tolyl alcohol.

Adjuvants. Alpha ionone, heliotropine, ylang Bourbon, phenylethyl alcohol, hydratropyl alcohol, isobutyl benzoate, amyl salicylate, isobutyl salicylate, isobutyl phenylacetate, paramethoxy acetophenone, paraethoxy acetophenone, nerolin, yarra yarra, methyl heptine carbonate, amyl cinnamic aldehyde, hexyl cinnamic aldehyde, phenylethyl propionate, hydratropyl acetate, cinnamic alcohol.

Fixatives. Musk ketone, musk xylol, Peru Resin, vetyvert, methyl naphthyl ketone, benzoin resin, benzyl

salicylate, benzyl isoeugenol.

Naturals. Absolutes of jasmin, rose, orange blossom, jonquille, neroli, French petitgrain natural and terpeneless, rose otto.

ACACIA BLOSSOMS E.043

45	Anisic aldejude
40	Methyl anthranilate
3	Paramethyl acetophenone
6	Cinnamic alcohol
6	Isobutyl phenylacetate
3	Benzyl acetate
8	Citronellol
4	Linalool
4	Hydroxycitronellal
8	Hydratropyl alcohol
6	Phenylacetaldehyde 50% in benzyl alcohol
3	Vanillin
3	Phenylacetic acid
2	Methyl naphthyl ketone
10	Heliotropine
2	Aldehyde C-16 100%
4	Musk ketone
1	Aldehyde C-14 10% in DEP
4	Benzophenone
5	Petitgrain South American
2	Rose otto
2	Coumarin
10	Benzyl salicylate
22	Diethyl phthalate
200	

HELIOTROPINE

The single chemical, heliotropine, which is frequently used as a floral adjuvant in lilac work, very closely approximates the heliotrope fragrance. The lilac and heliotrope are so closely related in odor that any reasonable lilac simulation may be transformed into some semblance of heliotrope by substantially increasing the heliotropine content. Better results are obtained by simultaneously increasing the rose notes and adding a touch of an almond effect. Since the lilac and heliotrope are so closely related, a discussion of the use classification will be dispensed with.

SWEET PEA

The sweet pea fragrance is basically a combination of lilac, hyacinth, and neroli notes, discreetly embroidered with rose and occasionally tuberose and jasmin. Some perfumers describe the sweet pea fragrance as a kind of "greened up" fancy lilac.

Terpineol is the base of the lilac note. Phenylacetaldehyde and its homologues furnish the hyacinth touch. Petitgrain is generally used to contribute the neroli effect.

Benzylidene acetone has a remarkable sweet pea note when diluted. However, it is one of the most irritating of perfume chemicals; this is also true of its paramethyl derivative. Phenylethylidene acetone and hydratropylidene acetone, made respectively from phenylacetaldehyde and hydratropic aldehyde, are less well known than benzylidene acetone but actually have a fine sweet pea odor. Their irritation potential is about half that of benzylidene acetone.

Following are the "use" classifications of the sweet pea components.

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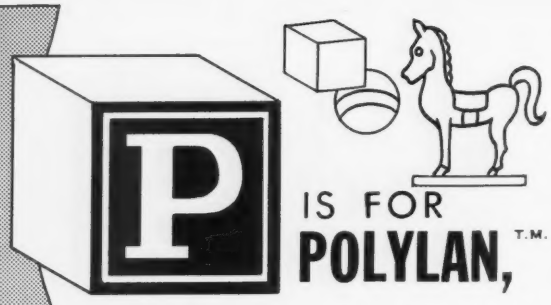

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Basics. Petitgrain, phenylacetaldehyde, paramethyl hydratropic aldehyde, citronellyl oxyacetaldehyde, phenylacetone, benzylidene acetone, paramethyl benzylidene acetone, phenylethylidene acetone, hydratropylidene acetone.

Blenders. Oil bergamot, oil orange, oil mandarin, dimethyl anthranilate, ethyl anthranilate, terpineol, heliotropine, geraniol, citronellol, rhodinol, dimethyl octanol, nerol, phenylethyl acetate and propionate, hydratropyl acetate and propionate, hydroxycitronellal, linalool, "Cumin" ketone, amyl cinnamic aldehyde.

Adjuvants. Geranyl acetate, citronellyl acetate, dimethyl octanyl acetate, ylang Bourbon, methyl ionone, ethyl phenylacetate, isobutyl phenylacetate, phenylethyl salicylate, methyl nonyl ketone, aldehyde C-12 MNA, aldehyde C-11 (undecylenic), phenylacetaldehyde dimethyl acetal, ethylene and propylene glycol acetals of phenylacetaldehyde, oil geranium African, amyl phenylacetate, isobutyl benzoate, phenylpropyl alcohol, phenylpropyl acetate, phenylpropyl aldehyde, civette.

Fixatives. Geranyl phenylacetate, guaiac wood acetate, tolu and Peru resins, musk ketone, musk ambrette, vanillin, ethyl vanillin, methyl naphthyl ketone, isoeugenol phenylacetate, benzyl isoeugenol, phenylethyl cinnamate.

Naturals. Rose otto, rose absolute, tuberose absolute, jasmin absolute, ylang absolute, jonquille absolute, orange flower absolute, immortelle absolute, mimosa absolute.

The following is a sweet pea formula illustrative of the make-up of the fragrance. It can be varied in an almost unlimited number of ways at the discretion of the perfumer. Note carefully how it is built around a series of aldehydes, modified with alcohols, lightened with bergamot and orange, and then given a "green" touch with the phenylacetone. The balance of the formula is the "embroidery" and sweeteners.

SWEET PEA E.045

30	Terpineol
25	Oil bergamot natural
40	Linalool ex bois de rose
5	Paramethyl hydratropic aldehyde
7	Citronellyl oxyacetaldehyde
4	Phenylacetone
5	Oil petitgrain South American
8	Oil orange Italian
10	Alpha ionone
8	Isobutyl phenylacetate
6	Musk ambrette
12	Methyl naphthyl ketone
8	Heliotropine
4	Musk ketone
4	Ylang Bourbon
6	Anisic aldehyde
2	"Cumin" ketone
6	Hydroxycitronellal
4	Rhodinol
4	Hydratropyl alcohol

4 Dimethyl octanyl acetate
8 Benzyl salicylate

260

HYACINTH

The hyacinth fragrance is a blend of lilac notes, made heavy and sweet with jasmin and tuberose. It has a cloying odor, and does not find much use as a "solo" fragrance, except when it is worked into a cologne type with considerable citrus effect to give it lightness. Hyacinth does find extensive use as a floral adjuvant in many fantasies, and is used in about the same manner as jasmin. The fragrance of hyacinth varies somewhat according to the color of the flower. The blue hyacinth is inclined towards the orris-violet type. The pink is of the honey sweet, phenylacetic acid type. The white is lightest and most delicate of all. As a "solo" fragrance, the white type is best; as a working base the pink is more effective.

The reproduction of the hyacinth fragrance is fortunately made fairly easy by the existence of a number of synthetics whose odors resemble it. Phenylacetaldehyde, hydratropic aldehyde and paramethyl hydratropic aldehyde have distinct resemblance to hyacinth. This can be said of cinnamic alcohol, phenylpropyl alcohol and hydratropyl alcohol in a lesser degree. Galbanum oil, appropriately sweetened with phenylacetic acid, takes on the appearance of hyacinth. Bromstyrol has a very coarse but nevertheless recognizable hyacinth touch.

The following are the "purpose" classifications of the hyacinth components.

Basics. Phenylacetaldehyde, hydratropic aldehyde, paramethyl hydratropic aldehyde, cinnamic alcohol, hydratropyl alcohol, phenylpropyl alcohol, phenylethyl phenylacetaldehyde acetal.

Blenders. Phenylacetaldehyde dimethyl acetal, hydratropic dimethyl acetal, heliotropine, linalool, bergamot, terpineol, benzyl propionate, benzyl acetate, benzyl butyrate and isobutyrate, benzyl alcohol, tolyl alcohol, phenylethyl alcohol, petitgrain oil, hydroxycitronellal, cyclamen aldehyde, "Cumin" ketone, hydratropyl alcohol.

Adjuvants. Ylang Bourbon extra, paramethyl benzaldehyde, cinnamyl acetate, cinnamic aldehyde, amyl cinnamic aldehyde, paracresyl phenylacetate, benzyl phenylacetate, phenylethyl isobutyrate, paracresyl caprylate, methyl anthranilate, oil of mandarin natural, paramethoxy acetophenone, alpha ionone, methyl ionone, cuminic aldehyde (traces), "neo-folione" (methyl nonylenate), methyl benzoate, tuberyl acetate, eugenol.

Fixatives. The resins of galbanum, styrax and benzoin; civet, vanillin, musk ambrette, musk ketone, musk xylol, indole, skatole, benzyl salicylate, phenylethyl salicylate.

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Naturals. The absolutes of jasmin, rose, tuberose, orange flower, immortelle (traces); rose otto, neroli.

Following is a pink hyacinth formula suitable for use either as a "solo" fragrance or a working base.

PINK HYACINTH E.046

70	Phenylacetaldehyde 50% in benzyl alcohol
50	Cinnamic alcohol
10	Linalool
25	Terpineol
10	Oil bergamot natural
8	Benzyl acetate
6	Hydroxycitronellal
10	Hydratropyl alcohol
40	Heliotropine
6	Benzyl butyrate
2	Alpha ionone
2	Indole 10% in DEP
2	Coumarin
2	Methyl benzoate
4	Musk ketone
8	Phenylethyl alcohol
8	Rhodinol
2	Para methyl hydratropic aldehyde
4	Amyl salicylate
2	Amyl cinnamic aldehyde
4	Petitgrain South American
275	

JONQUILLE

The jonquille and narcissus are considered to be distantly related to the hyacinth in fragrance. The narcissus fragrance is heavy but delightful. Nevertheless it has neglible use in perfumery. As a "solo" fragrance jonquille is somewhat better but has not won any special recognition. However, jonquille can be extremely useful as an adjuvant in the creation of fantasy effects, because in addition to its hyacinth note, it has inflections of jasmin rose and tuberose. The complexity of its fragrance makes jonquille an excellent, reasonably priced enrichening material for medium-priced fantasy creation.

The following formula demonstrates the construction of the jonquille effect.

JONQUILLE E.046-A

5	Aldehyde C-12 MNA 10%
10	Oil estragon
20	Phenylacetate
20	Heliotropine
30	Phenylacetic acid
30	Musk ketone
30	Paracresyl caprylate
30	Ylang Bourbon extra
30	Paramethyl hydratropic aldehyde
30	Alpine violette standard (Rhodia Co.)
30	Oil petitgrain South American
30	Anisic aldehyde
40	Phenylethyl alcohol
40	Citronellol
40	Benzyl acetate
40	Eugenyl phenylacetate
50	Vanillin
50	Nerolin
50	Oil sandalwood
60	Amyl cinnamic aldehyde
60	Benzyl salicylate
75	Paracresyl phenylacetate
100	Tolyl acetate
100	Hydroxycitronellal
1,000	

The hyacinth note is derived from the paramethyl

hydratropic aldehyde. Vanillin, nerolin and oil of sandalwood furnish the narcissus effect. Tolyl acetate and ylang Bourbon "strike" the tuberose note. Jasmin, rose and lilac components are readily recognizable.

ASPRO PLANTS

(*Continued from page 441*)

Dandenong Mountains. Here an extensive research program in human and veterinary medicine is being conducted. One of the products of this research, Megamide, a barbiturate antagonist, is being sold in this country by Abbott under a license arrangement.

In developing the English plan, a similar site limitation was imposed. In Slough, near the company's original plant or plants, the company owned a long narrow piece of ground which for years had been used partly as a sports ground for employees. The sports ground contains six or seven acres and is the most beautifully landscaped and maintained sports ground I have ever seen. Although the site was too narrow to permit two-way expansion, the management nevertheless decided to utilize it because of labor conditions. Because of pay rates and excellent working conditions, the company always has had the pick of the labor force in the area and has never had a union even though all the plants around it are unionized.

Since the plant site fell away sharply at one end, it was decided to build a multiple-story unit for offices and plant services attached to a single-story factory and warehouse block. The lowest part of the service section contains the power plant and service garage. The company maintains all officers' and executives' cars and a fleet of delivery trucks. Nationalized British Road Services are so bad and so expensive that the company found it could maintain its own fleet of delivery vans and not only provide faster service to customers but save money as well.

The ground floor, on a common level with the factory, houses plant and employees services. It contains reception lobby, interview rooms, factory offices, personnel and medical offices, locker rooms, toilets, kitchen and canteen or cafeteria, and maintainance shops.

The floor above the main plant entrance houses the directors' suites, the general offices and, at the rear, the control labs. Between the directors' suites and the general offices there is a patio or open courtyard—an expensive architectural gimmick that serves no useful purpose that I can see. (The so-called architect did his damndest to interpolate another patio in the middle of the packaging department, but I stopped that.) I did not object to the one in the service block because it does not interfere with plant operations and its location in the service block is such that it does not interfere with the operation of the offices or the employees' services.

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Through the service block, and separating the installations on the ground floor from the factory proper, is a pedestrian circulation corridor which extends straight through the building. From the main employee entrance, workers go directly to their departments through this corridor. Above this corridor is a second story which houses all building service equipment: heating, air conditioning, dust collection and the like. Had there been sufficient ground space, I would have preferred to locate all building service equipment on the ground floor parallel with the departments it serves. This would have been cheaper from a construction point of view, but it was out of the question because it would have required a strip 40 feet wide straight through the short axis of the building. By being placed above the operating departments, it was put out of the way, and plenty of space was made available for additional service equipment as the plant expands.

Like the Australian plant, this factory is laid out in two parallel lines: operating and packaging departments forming one, and warehousing the other. The English plant differs from the Australian plant, however, because of the necessity of separating the Ivers-Lee operation from the regular Nicholas production. Like its counterpart in America, the Ivers-Lee operation is a service operation for other companies of every conceivable kind. Not only must the products be kept separated during the course of production to prevent mix-ups, but the inventories, apart from some paper stock, do not belong to the company and must be kept separated. Hence the Ivers-Lee operation occupies a section straight through the warehouse and operating areas. Materials for this operation are palletized at a common receiving point but are stored in this segregated area. Like the regular Nicholas products, these too follow a C flow from warehouse through processing and back into warehouse again. In effect, the general layout is a twin C. Materials flow through the Ivers-Lee section toward the center of the building while, from the other side and in the opposite direction, materials flow through Nicholas processing and packaging toward the center of the building likewise.

This means, of course, that the finished stock storage section is located in the center of the building instead of at one side in the usual manner. Thus the arrangement of the warehouse from the front of the building toward the rear is: Ivers-Lee materials, Ivers-Lee finished stock, Aspro-Nicholas finished stock, Nicholas packaging materials, Nicholas raw materials. Receiving and shipping are centralized. Throughout the plant everything is palletized.

Palletization presented a difficult problem because of the Ivers-Lee materials. These materials are not controllable by Aspro-Nicholas. Every conceivable kind of package and container is received: drums of all sizes, kegs, barrels, carboys, cans, crates, baskets, bundles, rolls of various sizes, sacks and cartons. If

you can think of anything else, it is included. Quantities vary all over the lot from a fraction of a normal pallet load up to several full pallet loads. Since these materials are owned by customers and must be quickly available to service production schedules, it was necessary to develop a handling method that would made the stock readily available without mixing it up and without wasting space. Shelving was out of the question because of equipment and handling costs, and waste of space as well as inflexibility.

Socket pallets were adopted with removable corner uprights. These uprights are pieces of black iron pipe varying in length from one to three or four feet. These uprights are stacked in bins near the receiving point. The receiving clerk sizes up the incoming load and determines the length of uprights that will be needed. These are inserted in the sockets and the pallets loaded. All pallets are identified by number and the warehouse is not only indexed by section, but also by stack and tier. The fork truck operator is given this information and he puts the pallet into its designated place. Different customers' materials are palletized in mixed stacks. A single stack may contain four pallets holding the materials of four different customers. A copy of the receiving tag indicating location is sent to the planning department and filed. When the material is required, notice is sent to the dispatching area in the warehouse. Instructions are given a truck operator and, should the required pallet happen to be the bottom one in a stack, the fork truck operator picks up the entire stack, placing it in the aisle; he lifts off the pallets above the one he wants and replaces the stack in its original position. Then he picks up the required pallet and delivers it to the indicated position on his ticket. In order to do this quickly and easily it is necessary to use heavy lift trucks. The use of consolidated mixed stacks saves an enormous amount of space and the little extra re-handling is far more than economically justified.

Aspro-Nicholas customers' orders are assembled on very large pallets in the order in which the goods will be delivered to the customers. The delivery trucks have bed rollers and each holds three of these large pallets. A fork truck operator shoves the pallets into the van and it is ready to take off in a matter of minutes.

Incoming materials are received in all sorts of trucks. Some are end-loaded and some are side-loaded. Consequently the receiving and shipping dock had to be designed in such a way that the fork trucks could unload or load from the ends or sides of the trucks. Wherever possible arrangements have been made with suppliers to palletize incoming materials.

In laying out the manufacturing departments, we located the main service aisle used to make raw material deliveries to manufacturing departments several feet away from the rear wall, so that the strip of

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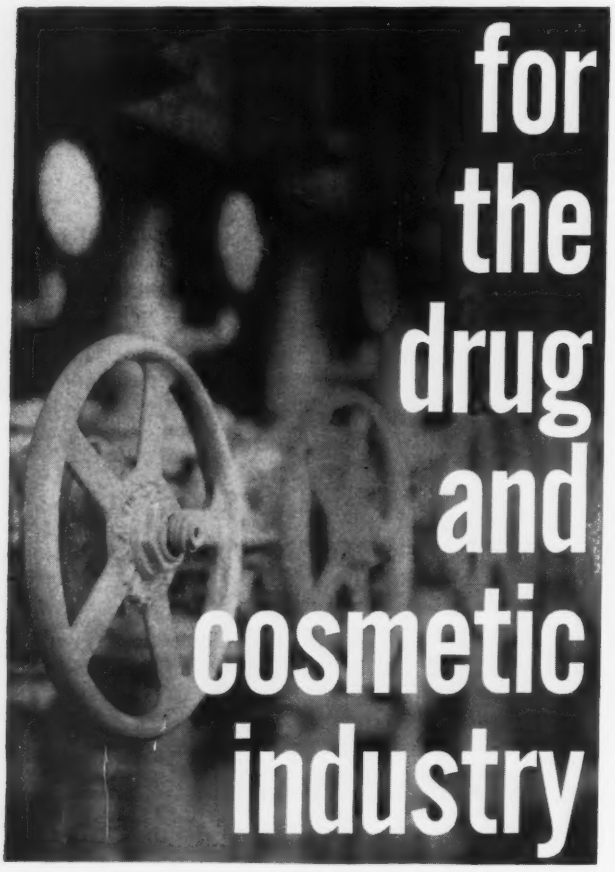
space along the rear wall of the factory could be utilized for processing departments that, for one reason or another, would have to be isolated by partitions from the principal manufacturing areas. On the opposite side of this aisle the principal manufacturing departments are located. The tablet and dry products department is partitioned off from the remaining production departments because it is air-conditioned and dehumidified. Other areas of the manufacturing section are allocated to the production of liquids and semi-solids such as ointments and pastes. These manufacturing departments feed directly into packaging departments and the flow is toward the center of the building where all finished stock is picked up from both the Aspro-Nicholas and the Ivers-Lee sections. The two sections are separated from each other by means of demountable partitions.

Acetylsalicylic acid and dried starch are received in ton weight, moisture-proof, palletized tote bins for the manufacture of Aspro tablets. These bins are placed in dumping position by fork trucks. Weighing and mixing are automatic. Mixed product is delivered to a battery of slugging presses which have no feed hoppers in the conventional sense. Slugs drop on an endless belt and are conveyed to a granulator. The speed of delivery and granulation is controlled so that the granulation contains just the right amount of fines to make smooth tablets. Granulation is continuously delivered to a battery of high-speed rotary presses, which likewise have no feed hoppers and, since the material is not agitated during delivery to the presses, stratification of the granules does not take place. Finished tablets are stored in cans for a couple of days to harden and are then electronically inspected and dusted. If it had not been for this necessary hardening operation, we would have automatically delivered the finished tablets directly to the Sanitaping machines. Special dust-collecting apparatus was designed for the department; consequently it is spotless, and its efficiency is indicated by the fact that three men can make considerably in excess of 6000 tablets daily. Controls with respect to quality, crushing point and solubility are just as rigid as they are here. I will repeat: Aspro is way ahead of us in making tablets in large volumes.

All services to equipment are located overhead. To eliminate a forest of conduits, piping and ducts dropping down to equipment, we bunched them at intervals and wherever groups of machines operate together we carried the service lines along under the conveyors to the individual machines. We decided against gridding the floor because of inflexibility of layout, the inherent difficulty of making equipment changes, and cost. Our decision was motivated also by the fact that it is never possible to get rid of all the drops even when there is a basement under a



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building because, if nothing else drops down from the ceiling, there will still be dust-collecting ducts rising up from equipment. Even in plants that have basements you will find that a good many serivce drops come down from overhead, even though the majority may come up from below.

The English factory has a flat roof and is entirely lighted artificially. In the factory there is no roof lighting, which is an innovation in England. Sidewalls likewise are to all intents and purposes blank, except for a few picture windows which are decorative only, and useless as a means of admitting outside light. The operating areas are comfort-conditioned with well water as the coolant. Heating is done by means of a high-pressure hot water system. This system is rarely used in this country and I don't know why. It is cheaper to install, lines are smaller and it is almost maintenance-free because no traps are necessary. It is a continuous circulation system which can be used also for processing where temperatures required are not in excess of those normally provided by low-pressure steam.

The progress of the Nicholas companies will bear watching. They are striding into the future with several of the most efficient plants in the world; they have good products, a young hard-hitting group of officials and executives and a research plant that is extensive, well equipped and ably staffed.

GLYCERINE IN DENTISTRY

(*Continued from page 443*)

packed *lightly* into the socket so that its sedative action will be effective without delaying wound granulation.

Root Canal Therapy

The function of glycerine in root canal compounds is most often that of a solvent and massing medium. Recently, Gossman[5] cited the use of a glycerine-containing preparation in chronic hyperplastic pulpitis. After the hyperplastic pulpal mass is removed, the cavity should be washed with water. The bleeding can then be controlled with a saturated solution of alum in equal parts of water and glycerine.

Glycerine has similarly been used in pulp mummifying paste when the object of therapy is to preserve the radicular portion of the dental pulp in an aseptic state, and hence to obviate the necessity for root canal treatment and filling.[5] After the pulp has been devitalized, the pulp chamber is thoroughly cleaned, then swabbed with a pledget of cotton moistened with phenol and dried with sterile cotton. Most of the pulp chamber is then filled with the following paste which is tamped down into close contact with the pulp stumps: tricresol (10 cc.), creolin (20 cc.), glycerine (4 cc.), paraformaldehyde (20 grains), and zinc oxide (66 grains). A layer of oxy-

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phosphate of zinc cement should then be applied to provide solid support for a permanent filling.

Dental Prophylaxis

Disclosing solutions and abrasive pastes, both a part of dental prophylaxis, very frequently contain glycerine. While preparations other than those containing iodine have been adapted as disclosing paints for bacterial plaques and food debris, those most often recommended for use in general practice[7] are the following: potassium iodide (1.6 g.), iodine crystals (1.6 g.), water (13.4 cc.), and glycerine to make 30.0 cc.; *or* zinc iodide (2.3 per cent), potassium iodide (2.3 per cent), iodine (7.7 per cent), glycerine (49 per cent), and distilled water (38.7 per cent).

Of the many abrasive pastes in general use, one of the most commonly used is that consisting of pumice flour (170.0 g.), borax (30.0 g.), glycerine (75.0 cc.), spearmint oil (5 drops) and amaranth solution as needed.

One of the three principal ways in which fluorides are being used to retard dental caries is by topical application to the tooth surface.[10] A prophylactic preparation, to add fluorine in significant quantities to the enamel of youngsters, recently was evaluated by Kimmelman.[1] This clinical evaluation appeared to stem from the favorable results in caries control reported for topical application of sodium fluoride to deciduous and young permanent teeth with the "Bibby method" (one seven- to ten-minute application every four months) and the "Knutsen method" (four closely spaced applications of three to four minutes each). The author tested a number of fluoride preparations and found that one of the most satisfactory was a commercial sodium fluoride glycerine-containing preparation. The cream consisted of aqueous sodium fluoride (2 per cent), titanium oxide (2 per cent), sodium lauryl sulfoacetate (0.3 per cent), glycerine, thymol and menthol. Applications varied from five to 12 minutes.

Dental Impressions

A new glycerine-containing material has been developed for taking impressions primarily for dental purposes.[13] The patent claims the method of using polymerizable compounds capable of gelling in a polymerized state with solvents. The compound is mixed with a solvent and brought to a paste-like consistency with fillers. The catalyst is added, and the impression is made before hardening. One example cited was the following formulation: 20 parts talcum is made into a paste with an equal amount of 75 per cent glycerine, 4 parts acrylamide, 0.5 part triacryloyltrimethylenetriamine, and 25 parts 1.5 per cent agar solution. The catalyst mixture contains 0.1 part triethanolamine and 0.2 part potassium persulfate. Aqueous solutions of glycerine may be used as solvents for the dental impression materials.

Dentifrices

Because "with no difference as to age or sex, every human being is a candidate for the daily use of toothpaste,"[29] toothpaste sales are estimated at over $155,700,000 annually.[3] It is to this market that glycerine offers the highly functional and salable effects of humectant and plasticizing action, viscosity and bodying, stability and nonvolatility, lubricity, solvent power, nontoxicity and sweet taste.[30, 34] All these characteristics contribute to the flavor, consistency and acceptability of today's toothpastes.

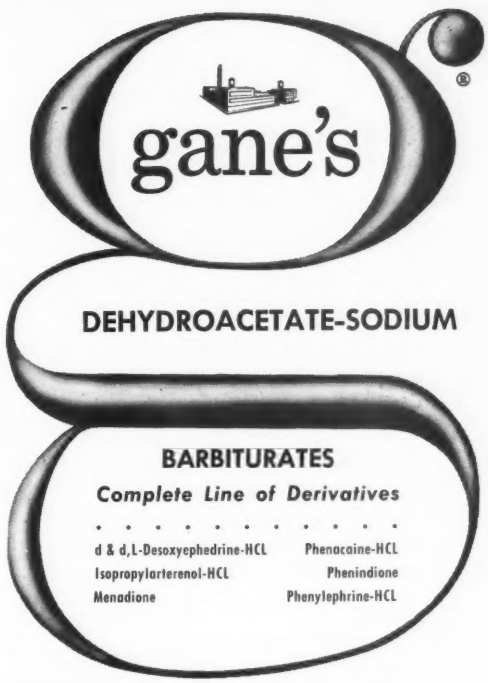
Thus, the function of glycerine in toothpaste formulations probably indicates to a greater extent than any other single application the versatility and usefulness of this chemical. Furthermore, the use of glycerine in toothpastes more pointedly emphasizes the quality of its physical and chemical characteristics, since it is often present at concentrations ranging from ten to 40 per cent.[33]

The following dentifrices represent a number of the most recent contributions in toothpaste formulation both from the standpoint of antibacterial action and of improved stability and performance. The "therapeutic" toothpastes contain ingredients intended to reduce or minimize caries formation. However, it is not the purpose of this paper to evaluate the evidence necessary to support such data, since this can only be a review of the claims made by the patentees or inventors. Furthermore, it is yet too early to evaluate the efficacy of many such preparations as related to new concepts of caries such as chelation.[4]

Considerable attention has been given to the use of fluorides in dentifrices. Results of several clinical studies on the use of a stannous fluoride containing dentifrices have been published.[9] A new preparation of fluorinated dialkali-alkaline earth pyrophosphates has been suggested[14] to provide an improved fluorinated polishing and cleansing agent. The toothpaste contains 40 to 60 per cent dry base (b.w.) combined with varying percentages of glycerine and other constituents, such as gums and flavoring agents, as necessary.

Of the many oral preparations claimed to inhibit dental caries, one group which has aroused considerable interest has been the "anti-enzyme" toothpastes. The effectiveness of the formulations containing sarcosides is said to result from a combination of acid-inhibitory action and adsorption within the oral cavity. A typical formulation is given as[19] calcium carbonate (12.1 per cent), dicalcium phosphate dihydrate (36.2 per cent), sodium N-lauroyl sarcoside (2.0 per cent), glycerine (30.6 per cent), water (15.2 per cent), Irish moss (1.0 per cent), and sweetening, flavor and preservative as necessary.

A similar formulation[12] containing sodium stearoyl sarcoside is claimed to have antibacterial action on the oral flora, and to reduce the solubility of tooth enamel in acid.



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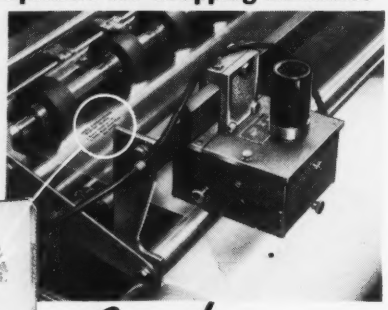

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Another formulation,[11] containing disodium diacid pyrophosphate, is claimed to have excellent stability on aging. The role of the glycerine as a humectant is said to help obtain good consistency initially and on storage, improved hygroscopicity and plasticizing action, and solubilization effects.

Another group of "anti-enzyme" preparations has been based on the use of dehydroacetic acid and its salts, and recent research[35] describes the positive clinical effects obtained. One example[16] of this type of dentifrice composition consisted of calcium sulfate (35.7 per cent b.w.), dicalcium phosphate (15.6 per cent), detergent (3 per cent), gum (1.4 per cent), glycerine (19.9 per cent), sodium salt of dehydroacetic acid (0.5 per cent), and water (22.5 per cent). The remaining ingredients are the flavoring, preservative and so on.

Certain guanidine salts are claimed to possess a high degree of stability and marked antibacterial power on oral flora normally present in the mouth.[17] Formulated as dental creams containig 25-29 per cent glycerine, they are also reported to inhibit acid production from carbohydrates.

Sucrose esters of fatty acids are a new class of nonionic emulsifiers permitting the development of products with improved stability and performance qualities.[21] The following toothpaste, also formulated with glycerine, has a minimum stability period of six months: sucrose monopalmitate (2.5 parts by weight), CMC 120 high viscosity (0.8 p.b.w.), glycerine (10.0 p.b.w.), propylene glycol (20.0 p.b.w.), methyl paraben (0.2 p.b.w.), water (14.0 p.b.w.), mineral oil (1.0 p.b.w), dicalcium phosphate (51.5 p.b.w.), and other flavoring ingredients.

A new nonstaining chlorophyll dental cream has been reported, employing glycerine as its chief vehicle:[22] polyvinylpyrrolidone (0.5 per cent), sodium copper chlorophyllin (0.1 per cent), dicalcium phosphate dihydrate (48.3 per cent), glycerine (28.2 per cent), detergent (3.8 per cent) and tetrasodium pyrophosphate (1.0 per cent). Since the effect of pyrrolidones generally is claimed to be antibacterial, such compounds recently have also been formulated in dental creams containing about 30 per cent glycerine.[15]

Dental creams formulated with calcium phosphate as a polishing agent can be stabilized by the addition of monoglycerides.[23] Monoglyceride (up to 10 per cent) counteracts the tendency of calcium phosphate to lose water of hydration and harden in the tube. An example of a formulation having uniform body, improved stability and resistance to aging is given as: dicalcium phosphate dihydrate (50 per cent), glycerine (26 per cent), gum (1 per cent), water (13 per cent), sodium N-lauroyl sarcoside (2 per cent), monoglyceride ester (3 per cent) and flavor and sweetening as needed.

A dentifrice composition containing tyrothricin has been reported[18] to be highly effective in reducing

lactobacillus count and inhibiting lactic acid formation. One of the formulas reported was the following: tyrothricin (0.05 per cent), insoluble sodium polymetaphosphate (26.9 per cent), dicalcium phophate (26.9 per cent), gum (1.3 per cent), sodium lauryl sulfate (1.1 per cent), glycerine (18.9 per cent), propylene glycol (1 per cent), water (22.7 per cent), and flavor (as necessary).

Of the many ammoniated toothpastes which have appeared on the druggist's shelf, one formulation claimed to be excellent[25] is the following: ammonium phosphate dibasic (9.0 parts by weight), dicalcium phosphate (68.0 p.b.w.), urea (5.0 p.b.w.), tragacanth (1.5 p.b.w.), sodium saccharin (0.1 p.b.w.), sodium lauryl sulfate (4.2 p.b.w.), glycerine (50.0 p.b.w), water (55.0 p.b.w.), and flavor (2.9 p.b.w.).

Quite recently a new thickener, Carbopol 934 (B. F. Goodrich Chemical Co.) has been developed for glycerine, suggesting new applications for glycerine as well as improvement in many of its present formulations. Among these projected uses is the incorporation of Carbopol 934-thickened glycerine in tooth pastes.[31] The advantages cited for such a mixture in toothpaste formulation are: (1) the quantity of polishing agent which can be added successfully is increased; (2) water can be excluded entirely from the preparation, producing the optimum in nondrying properties and gloss; and (3) the yield value imparted by thickening with Carbopol 934 appears to be desirable in minimizing the "flattening out" tendency of a filament of extruded toothpaste.

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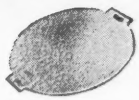

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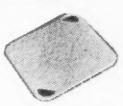

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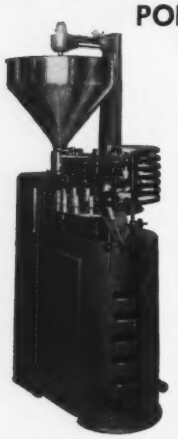

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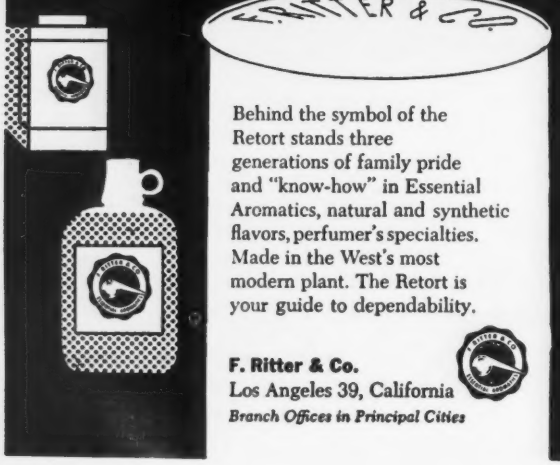

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SHAMPOOS

(*Continued from page 445*)

these formulas represents acceptable finished products, or that the authors who presented them ten years ago did not represent them as such. They do serve as skeletons to illustrate that amine or alkylolamine salts are frequently used in clear shampoos, where their somewhat greater solubility contributes to a lower cloud temperature; that the lotion shampoos contain a complex mixture of opacifiers and conditioners whose stability is an important problem in this type of formula; and that the creme shampoos usually contain an appreciable quantity of soap in combination with a sulfated syndet.

The combinations of ingredients which have been used to solve the problems of shampoo formulation are now so numerous that it is not possible to detail them here. The usefulness of alkylolamides as thickeners, foam stabilizers and hair conditioners has often been cited,[2] and has made them perhaps the most versatile and popular of shampoo additives. Soap as an ingredient of many syndet based shampoos has shown much value. But to go on with this list would require a monograph. Perhaps we can look forward to such a treatise, since this field now embraces a great quantity of data begging for analysis and critical appraisal.

We have skimmed through the field of shampoo formulation necessarily emphasizing the two anionics in greatest use. It is literally quite impossible to trace the end-uses and consumption in shampoos of many other anionic syndets which are used in shampoos either in conjunction with those we have mentioned. or as principle active ingredients. One thinks at once of the N-acyl amino acids, the sulfated polyoxethylated alkanols and the several amphoterics which. while as yet relatively minor in volume, are by no means minor in their contributions to many specific shampoo formulas.

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DRUG RESEARCH

(*Continued from page 446*)

even smaller dosage and presumable reduced side reactions of the new dexamethasone are marked ad-

vantages. Here again, the newest improved drug seems to involve a shared patent position, with Merck and Schering as the principals.

In the field of oral antidiabetic drugs, to take another example, Lilly's carbutamide was discontinued before actual marketing, leaving the field to Upjohn's tolubutamide. Even this very fine product maintained its unique position only for a very short time; it now shares available demand with Pfizer's chlorpropamide, another sulfanilamide derivative. U. S. Vitamin's biguanide compound phenformin is ready to enter the lists, while metahexamide is undergoing clinical tests under the separate auspices of Lilly and Upjohn.

In the original antibacterial field itself, sulfa derivatives can still generate competitive excitement. "Kynex" of Lederle introduced the possibility of effective action with relatively small and infrequent doses, but now shares its position with Roche's "Madribon."

These selected examples illustrate the relatively short life span that may be expected for presumably unique products resulting from long and expensive research effort. They also illustrate incidentally, except in the case of the steroids, that the sulfanilamide molecule in the hands of skilled chemists, pharmacologists and physiologists can be made to do acrobatic tricks far beyond the antibacterial conception of more than 25 years ago.

GLASS CONTAINERS

(*Continued from page 453*)

One should keep in mind that the plastic coating on a bottle has an elongation factor of 400 to 500 per cent. The expansion referred to in the plastic is linear, while expansion of the gas is cubic. A further explanation of this follows.

The total potential volume of the medium- and low-pressure aerosols, then, can be greater than the 400 to 500 per cent expansion of the plastic. Vents are placed in the plastic jacket to relieve the pressures developing before the elongation limit of the plastic is reached.

Two types of vents are used. One is a pin-point perforation placed in the sides of the plastic coating. This is barely visible and is normally not open until the plastic is expanded. The other is a positive hole, 0.90 thousandths of an inch in diameter. From two to six of these are placed in the bottom of a bottle intended for a product with a high percentage of propellant.

Now, consider the compressed gases in the table below. This package uses nitrogen as the propellant. The capacity and headspace are the same. The pressure, however, is 90 pounds per square inch. The expanded volume—only 200 per cent—is well below the elongation limits of the plastic coating. "Nitrosol," incidentally, is a coinage of words indicating the use

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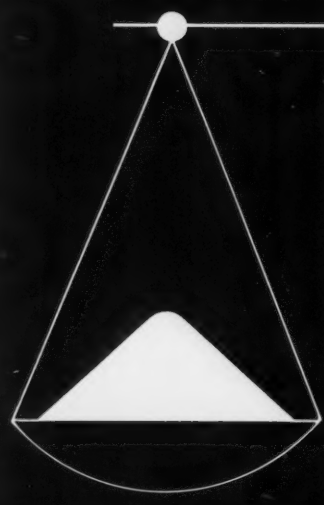

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of nitrogen or any other compressed gas as the propellant.

	Nitrosol (assuming no solubility of gas in product)
Capacity	140 ml.
Headspace	15%
Pressure	90
Expanded volume	200%

As a further illustration of this point, the small cube in Figure 3 represents a container filled with compressed gas at 90 pounds of pressure. Now, let us assume that this cube is a plastic-coated bottle. It is impacted with sufficient force to break the glass. The plastic would expand to 100 and then 200 per cent. Here you will notice an excellent example of linear as well as cubic expansion. In this case linear expansion of 26 per cent results in 100 per cent increase in volume; 44 per cent linear expansion equals 200 per cent increase in volume.

But at 100 per cent expansion, pressure has already dropped below 50 per cent, or less than 45 pounds; at 200 per cent expansion there is no gauge pressure at all, because it has arrived at atmospheric pressure somewhere before reaching 200 per cent expansion. With compressed gas there is no regenerating pressure or energy with the exception of that pressure originally charged into the package. In practice, a container would have 70 per cent of its capacity filled with product and a headspace of 30 per cent for gassing. In this case, pressure would be nonexistent before the elongation of plastic reached 100 per cent.

In each of these examples note that the safety features are concerned primarily with the breakage of the container. The package is first designed to prevent breakage but, should breakage occur because of severe mishandling—and I must emphasize severe, because normal mishandling such as accidental dropping has been taken into consideration—then, and only then, does the protection of the plastic and the operation of the vent holes become necessary. After venting, a container becomes a plastic bag of broken glass.

PRODUCT LIABILITY

(*Continued from page 435*)

in allergic response. If a woman develops a dermatitis in the exposed parts of her body after the use of a phenothiazine-containing tranquilizer, should the manufacturer be held responsible? How about the man who developed a rash when his wife kissed him, because his known sensitivity to a dandruff preparation resulted in cross-sensitivity to the lipstick of halogen derivatives of fluoresceine acid. In an other instance, a woman knew that she was sensitive to nylon and switched to silk stockings. How was she to know that she would develop a rash because of cross-sensitization to the certified azo dye that colored the cherry in her Manhattan cocktail? Sensi-

tization has also been demonstrated to certain antiperspirant and nail undercoat ingredients.

All of this requires a recasting of the attitudes of lawyers and the courts. The responsibility of the manufacturer for the quality of his product is a continuing factor, but must he be held responsible for the altered from the normal differing reaction of the user? Allergic responses are of course due to the sensitizing nature of substances themselves, but also to individualistic responses by the complex human being.

PATENTS

(*Continued from page 469*)

ness to a short term. However, the resinous materials, as obtained by my invention, can retain their antibacterial activity over a short time or a long time, depending upon the solubility of the antibacterial material employed. When a relatively insoluble antibacterial is employed, the activity can last over a long period of time."

The testing procedure employed in determining the effectiveness of the antibacterial resins is given as follows in the patent:

"The antibacterial activity of resin samples containing antibacterial material was tested by placing the resin sample ½" x ½" x ⅛" in blood agar base at 37° C. which was inoculated with 1 ml. of undiluted saliva obtained by chewing paraffin. The testing was carried out under aerobic and anaerobic conditions. The zones of inhibition were recorded after 48 hours. These zones of inhibition varied from 0.1 cm. to 3.0 cm. depending upon the concentration and the solubility of the antibacterial material. Then experiments were repeated using blood agar base which was inoculated with undiluted saliva and horse serum. Similar zones of inhibition were recorded under aerobic and anaerobic conditions.

Undiluted human saliva was used in the above experiments because it contains a broad spectrum of aerobic and anaerobic organisms which are resistant to antibacterials. According to my experience, it is easier to control the growth of *Staphylococcus aureus* than that of the variety of organisms found in saliva."

An idea of the manner of practicing the invention and the results obtained is given by Example 1 of the patent, which is reproduced below.

"A mixture of 10 ml. of methyl methacrylate, 0.5 g. of zinc phenoxide and 0.2 g. of benzoyl peroxide was placed in a test tube and sealed carefully. The test tube was placed in an oven at 60° C. for 24 hours. The polymerization proceeded smoothly. Samples of

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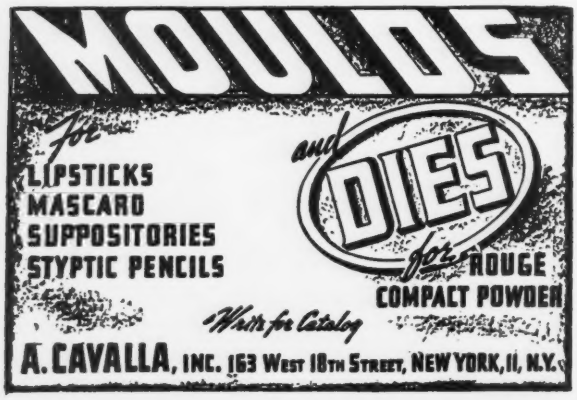

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the polymerized material were placed in blood agar base medium inoculated with 1 ml. of undiluted saliva obtained by chewing paraffin. Zones of inhibition of bacterial growth were studied at 37° C. under aerobic and anaerobic conditions. The zones of inhibition were recorded after 48 hours. Similarly, zones of inhibition were studied under aerobic and anaerobic conditions when the medium used consisted of blood agar base plus 1 per cent normal horse serum and was inoculated with 1 ml. of undiluted saliva. In these experiments, zone of inhibition varied from 1.0 cm. to 3.0 cm."

RECENT PATENTS

2,860,055—U.S.A.—Inhibiting Enzym Activity in Plant Tissue.

2,860,084 — Ruson Labs. — Germicidal Composition Comprising Iodine and a N-Aryl Colamino Formyl Methyl Quaternary Ammonium Salt.

2,860,086—Saul & Co.—Stable Solutions of Pure Cardioactive Glycosides.

2,860,131—Merck—Benzimidazoles.

2,860,134—Merck—7-Keto-11-Bromo-Steroids.

2,860,136—Akt. Ferrosan (Denmark) — 3-Mercurric-2-Methoxy-1-Succinimido Propanes.

2,860,137—G. D. Searle—Hal. 10-Phenothiazinylalkylaminoalkanoic Acids.

2,860,138 — Schering — Carbamate Esters of Hydroxyalkyl Piperazino Alkyl Phenothiazines.

2,860,147—Lasdon Foundation—3, 5-Cyclo Steroids.

2,860,148—E. B. Hershberg—Pregnadienes.

2,860,158—Sterling Drug—Perhydrochrysenes.

2,860,165—Schenley—Diaryl Disulfonamides.

2,861,024—Merck—Antibiotic Dusts.

2,861,026—Chas. Pfizer—Vitamin B_{12} Preparations.

2,861,074—Eli Lilly—Hydroxyergolenes.

2,861,075—Olin Mathieson — β-Lactone of Yohimbic Acid.

2,861,085—Syntex—19-Norderoxycorticosterone.

2,861,086—G. D. Searle—17-Oxygenated Estra-trienediols.

2,861,087—Upjohn—Methyl Androstane Triols.

2,861,088—Upjohn—Trihydroxy Pregnene Diones.

2,861,109—Hoffmann-La Roche—Poly-unsaturated Acyclic Di-ethers.

2,861,290—Upjohn—Therapeutic Suspensions of Steroids Containing PVP and/or PVA.

2,862,002—Hoffmann-La Roche—Synthesis of 4-Amino-3-Isoxazolidone

2,862,004-6—Merck—Dodecahydrophenanthrenes.

2,862,010—Upjohn—Steroids.

2,862,200—Hoffmann-La Roche — α-Amino-β-Hydroxy Hydroxamic Acids Derivatives.

2,862,025—C. E. Frosst & Co. (Canada)—Chloramphenicol Intermediate.

2,862,030-2—Nopco—Vitamin A Aldehyde Process.

2,862,034—Abbott Labs. — 3, 4-Dibenzyloxy-β-Nitrostyrenes.

2,862,851—T. Reichstein et al—Aldosterone.
2,862,852—Hoffmann-La Roche—Stabilized Vitamin D Composition.
2,862,921—Upjohn—Erythromycin Esters.
2,862,923 — G. D. Searle — 17-Pyridimacrylyl-4-Androsten-3-Ones.
2,862,924—G. D. Searle—Progesterones.
2,862,925—T. Reichstein et al.—Aldosterone Derivatives.
2,862,926—Olin Mathieson—Steroids.
2,862,935—G. D. Searle—3, 5-Dienic-7-Oxopregnanes.
2,862,936—Upjohn—21-Fluoro-Steroids.
2,862,937—Upjohn—Hydrocortisone and Cortisone 21-(2-Chloro-4-Nitrobenzoates).
2,862,938—Upjohn—21-(2-Chloro-4-Nitrobenzoate) of Predmisolone and Prednisone.
2,862,939—G. D. Searle—Trihydroxy Pregnene Diones.
2,862,953—Takeda Pharm. Industries (Japan)—Keto Octahydronaphthyl Methane.
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2,862,966-7—Sterling Drug — N-Alkyl-N-(Substituted Benzyl) Dihaloacetamides.
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2,863,873—Akt. Bofors (Sweden)—Esters of Nicotinic Acid.
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2,864,824—R. J. Strasenburgh—Alkoxy Derivatives of 3:5-Dioxo-Pyrazolidene.
2,864,825—Upjohn—Pyrrolidines.
2,864,830—Chas. Pfizer—11-Oxygenated Derivatives of 19-Norandrostadiene.
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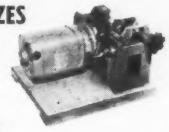

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